CS	2014-01-22	CE	Confidential

SINDOH 신도리코

SERVICE MANUAL

A610/A611 SER.

A610/A611 SER. LASER PRINTER

FIELD SERVICE MANUAL

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Specifications

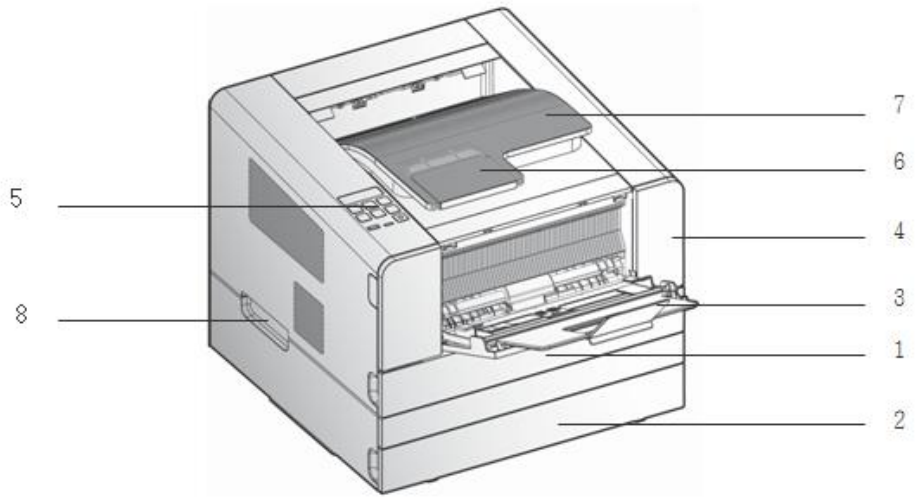
Main Body

Main Body Components (A610DN)

Type	Emulation	Model
		Civil
A610SER	SDAPL,PCL5e/6,PS3	A610DN

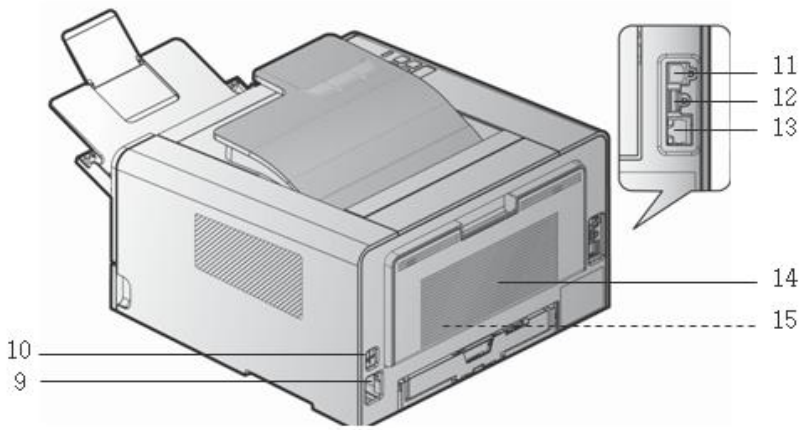
SDAPL (Sindoh Advanced Print Language) – GDI

Front



No.	Name	Remark
1	Tray 1	250 Sheets (75 g/m²)
2	Tray 2 (Optional Tray)	250 Sheets (75 g/m²)
3	Multipurpose Tray (MPT)	
4	Front Cover	
5	Control Panel	
6	Paper Support	
7	Output Tray	250 Sheets (75 g/m²)
8	Handle	

Back



No.	Name	Remark
9	Power Cord Connector	
10	Power Button	
11	USB Port Connector	
12	Wi-Fi Connector	
13	Ethernet Connector	
14	Back Cover	
15	Duplex	

Tray Capacity

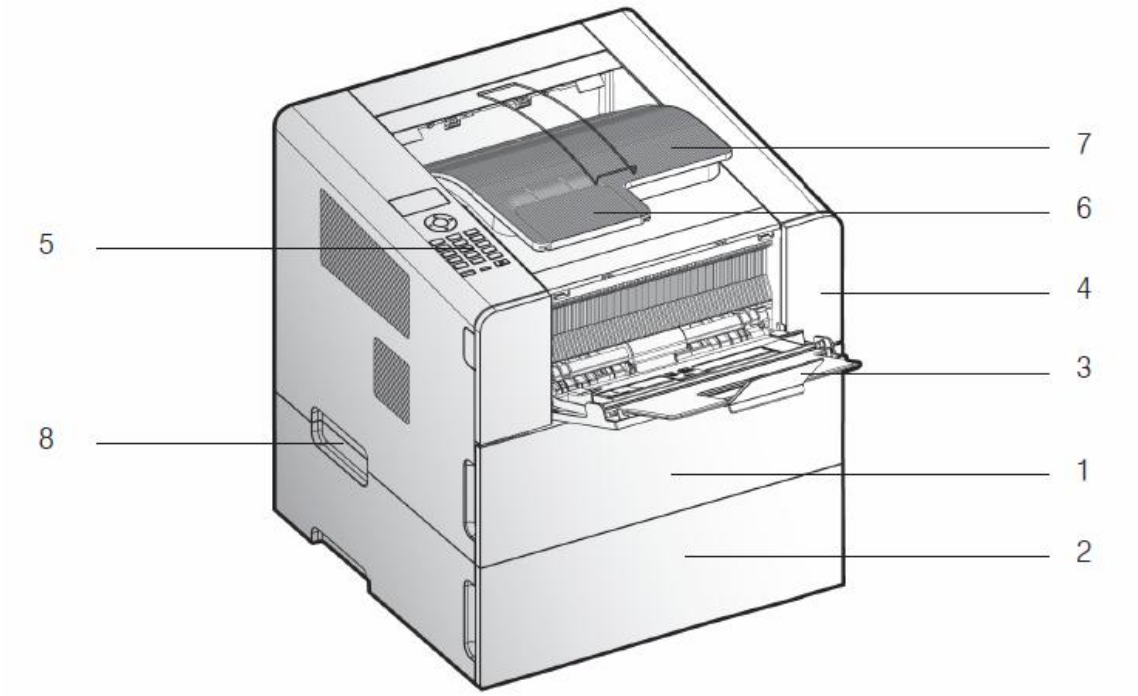
1. Basic Configuration: Tray 1 (250 Sheets) + MPT (50 Sheets)
2. Basic Configuration + 2 Optional Trays (250 Sheets)

Main Body Components (A611DN)

Type	Emulation	Model
		Civil
A611SER	SDAPL,PCL5e/6,PS3	A611DN

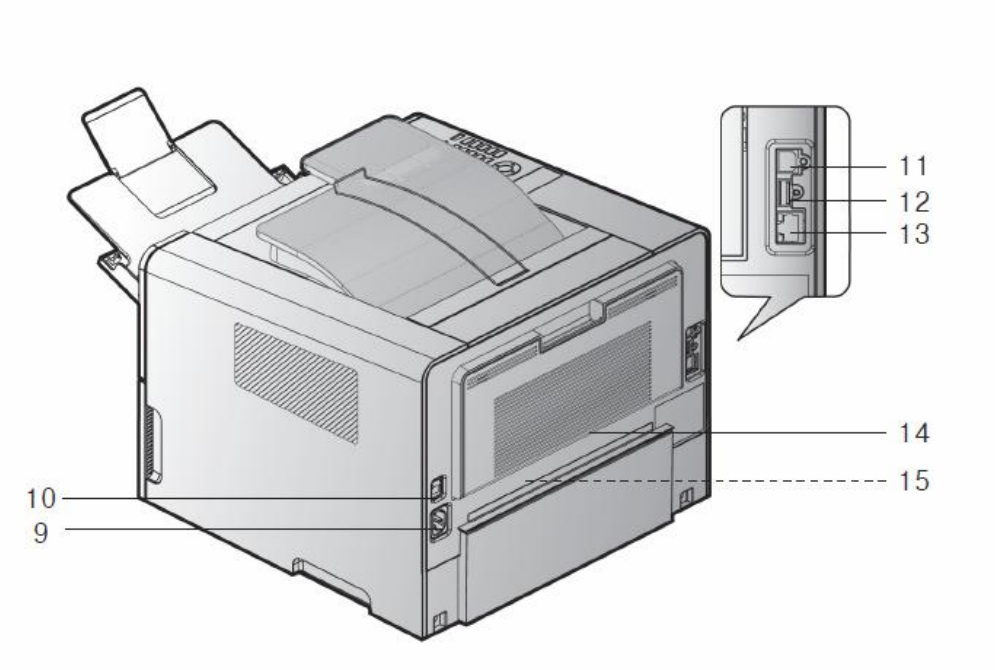
SDAPL(Sindoh Advanced Print Language) – GDI

Front



No.	Name	Remark
1	Tray 1	500 Sheets (75 g/m²)
2	Tray 2 (Optional Tray)	500 Sheets (75 g/m²)
3	Multipurpose Tray (MPT)	
4	Front Cover	
5	Control Panel	
6	Paper Support	
7	Output Bin	250 Sheets (75 g/m²)
8	Handle	

Back



No.	Name	Remark
9	Power Cord Connector	
10	Power Button	
11	USB Port Connector	
12	Wi-Fi Connector	
13	Ethernet Connector	
14	Back Cover	
15	Duplex	

Tray Capacity

1. Basic Configuration: Tray 1 (500 Sheets) + MPT (50 Sheets)
2. Basic Configuration + 2 Optional Trays (500 Sheets)

Main Body Specifications (A610DN)

Category	A610 Model
Printing Speed (A4)	40ppm
1st Page Printing Speed	Under 9 Seconds
Resolution (dpi)	600/1200 dpi
Tray Capacity	250 Sheets
Paper Size	A5 ~ Legal
MPT Capacity	50 Sheets
Output Capacity	250 Sheets
Duplex	O
Option	250 Sheet Tray
Memory	256MB
Processor	360MHz
LCD Display	128X32 Graphic LCD, (Korean Available) English/Korean
Interface Port	1USB Device/host, Ethernet 10/100Base T, Wi-Fi (801.21 BGN, Optional)
Emulation	SDAPL,PCL5e/6,PS3
OS	Windows XP, Vista, Win7,Win8, Windows sever 2008, Mac OS 10.4 and above, Various Linux OS
Image Cartridge (Enclosed)	6K(A610)
Weight	10.5Kg
Dimension (W X D X H)	383 X 386 X 234mm
Sound Pressure (dBA)	Idle: Under 40 dBA Printing: 55dBA
Power Consumption	Printing – 410W Idle – 70W Power Save Mode – 4W Off – Under 0.05W

Main Body Specification (A611/A616DN)

Category	A611 model
Printing Speed (A4)	47ppm
1st Page Printing Speed	Under 9 Seconds
Resolution (dpi)	1200 dpi
Tray Capacity	500 Sheets
Paper Size	A5 ~ Legal
MPT Capacity	50 Sheets
Output Capacity	250 Sheets
Duplex	O
Option	250 Sheet Tray
Memory	512MB
Processor	800MHz
LCD Display	128X64 Graphic LCD, (Korean Available) English/Korean
Interface Port	1USB Device/host, Ethernet 10/100/1000Base T, Wi-Fi (801.21 BGN)
Emulation	SDAPL,PCL5e/6,PS3
OS	Windows XP, Vista, Win7,Win8, Windows sever 2008, Mac OS 10.4 and above, Various Linux OS
Image Cartridge (Enclosed)	6K(A611)
Weight	13Kg
Dimension (W X D X H)	383 X 386 X 306mm
Sound Pressure (dBA)	Idle: Under 40 dBA Printing: 55dBA
Power Consumption	Printing – 790W Idle – 110W Power Save Mode – 6W Off – Under 0.05W

Paper Specification

Feeder Unit	By Paper Type	Paper Size	Weight
Main Tray (A610)	Standard: 250 Sheets Thick: Up to set height (Marked by Label)	A4, A5, JIS B5, Folio, Letter, Legal, Executive, Statement	60~120 g/m² (16~32lb)
Main Tray (A611)	Standard: 500 Sheets Thick: Up to set height (Marked by Label)	A4, A5, JIS B5, Folio, Letter, Legal, Executive	60~163 g/m² (16~32lb)
Optional Tray (A610)	Standard: 250 Sheets Thick: Up to set height (Marked by Label)	A4, A5, JIS B5, Folio, Letter, Legal, Executive, Statement	60~120 g/m² (16~32lb)
Optional Tray (A611)	Standard: 500 Sheets Thick: Up to set height (Marked by Label)	A4, A5, JIS B5, Folio, Letter, Legal, Executive	60~163 g/m² (16~32lb)
MPT (ALL)	Standard: 50 Sheets, Envelope: 5 Sheets, Label: 15 Sheets, Card Stock: 5 Sheets	Paper size between 76.2 X 127mm(3 X 5 inch) Min. 216 X 355.6mm Max. (8.5 X 14 inch)	60~166 g/m² (16~53 lb) Card Stock 90lb
Duplex (2-sided Printing) (ALL)	Standard	A4, Letter	60~90 g/m² (16~24lb)

When loading thick paper or paper under A5 in Tray 1, load up to the paper guideline (Thick) inside the tray.

For best feeding quality on paper sizes under A5, using the multipurpose tray is recommended.

Toner Specification

Item	Model	Life	
		Enclosed	AM
Toner Cartridge	A610/A611DN	6K	3K/6K/13K
Drum Unit	-	45K (Consecutive printing) 30K (3page/job) 18K (1page/Job)	

Conditions:

1. Life specified above is based on A4 and 5% charts.
2. Standard temperature and humidity
3. Life may vary according to environment and printing conditions.

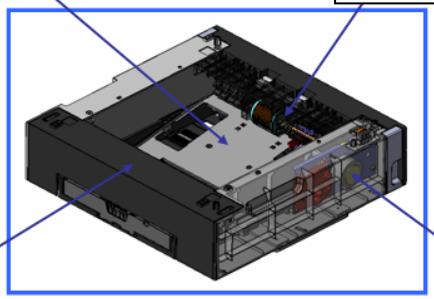
250 Sheet Option

Paper Feed Unit

Feeder Components

Feeder
1. Friction Pad A'ssy
2. Center Align System
3. Incline plate (1 EA) + Incline spring (2 EA)
4. 2 step end fence
5. Feeder beam sensor

Pickup & Feed roll A'ssy
1. Pickup roll A'ssy
   -D-roller, 2 idler
   -2 Segment gear clutch A'ssy
   -DC solenoid (1 EA)
2. Feed roll A'ssy
   -Rubber (EPDM) + TU
   -Backup Roller (POM, 2EA), Plate spring



Frame & Exterior
1. Frame: 2 mold parts + 1 Press part
2. Exterior: 6 mold parts.
3. Printer and AIO up/down mounted
4.: 89(W)X377(D)X103(H)

Operation
1. 1 Stepping motor
   - PM type, 1-2 Phase. 3.75° step angle
2. Use train of gears

Feeder Specification

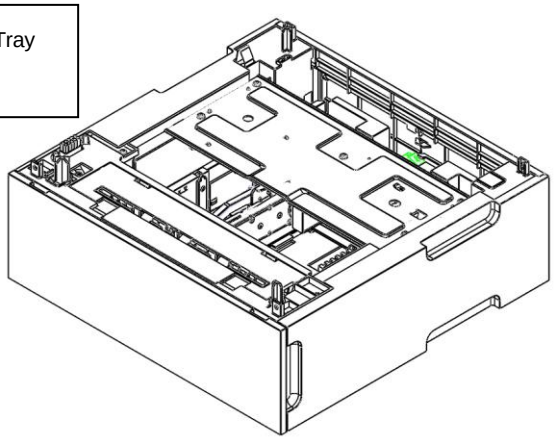
Category	Description
Function	Increase Tray's capacity
Speed	40PPM(A4)
Feeder Capacity	250 Sheets (75gsm xerographic paper)
Paper	Min. A5 ~ Max. Legal(xerographic OR business paper) (N/A: Envelope, postcard, label, etc.)
Paper Weight	16 ~ 90 lb (60 ~ 163gsm) paper
Dimension (H/W/D)	103 / 389 / 377mm
Weight	3.5kg approx.

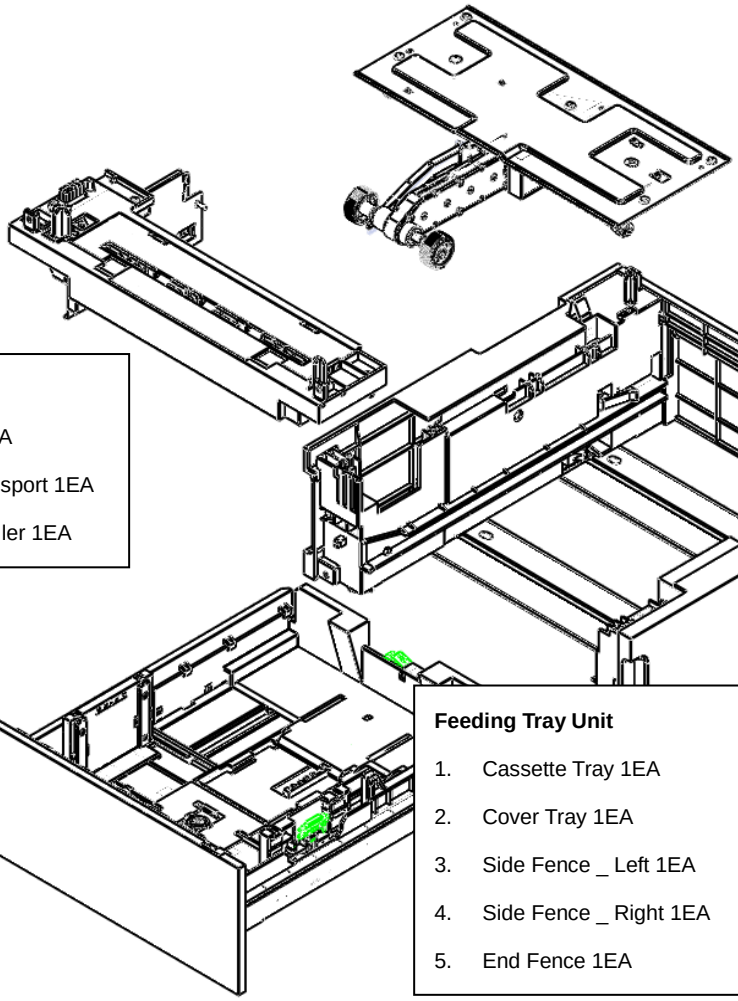
500 Sheet Option

Paper Feed Unit

Optional Feed

General View of Optional Tray





Feed Unit

1. DC Motor 1EA
2. Pick Tire 2EA (EPDM)
3. Gear Arm A'ssy 1EA
4. Gear Housing A'ssy 1EA
5. Gear Arm Pivot A'ssy 1EA
6. BKT Accufeed (PR) 1EA

Transport Unit

1. PM Motor 1EA
2. Housing Transport 1EA
3. Transport Roller 1EA

Frame & Exterior Unit

1. Frame A'ssy 3EA (MO 2, PR 1)
2. Exterior Cover 4EA

Feeding Tray Unit

1. Cassette Tray 1EA
2. Cover Tray 1EA
3. Side Fence _ Left 1EA
4. Side Fence _ Right 1EA
5. End Fence 1EA

Tray Specification

Category	Description
Function	Increase Tray's capacity
Speed	45PPM / 40PPM (A4 SEF, KARA-S 45PPM, KARA 40PPM)
Feeder Capacity	500 Sheets (75gsm) /1
Paper	Min. A5 ~ Max. Legal(Xerographic OR Business paper)
Paper Weight	16 ~ 90 lb(60 ~ 163gsm) paper
Dimension (H/W/D)	130.3 mm / 383 mm / 387 mm
Weight	4.5kg approx.

※ 250 sheet option cannot be installed in A611 model.
500 Sheet option can be installed in A610/A611 model.

Installation

Installing Conditions

Environment

⚠CAUTION

The printer must be installed at following places.

- Good ventilation and flat surface
- No obstacles within 8cm from printer's right side for cooling fan to operate properly
- No direct sunlight exposure and dustless and clean place
- No direct cold or warm air blown from air conditioner or heater
- Printer operating temperature: 15.6°C ~ 32.2°C (shipping and storage: -40.0°C ~ 60.0°C)

Installation

Unpacking and Checking Components

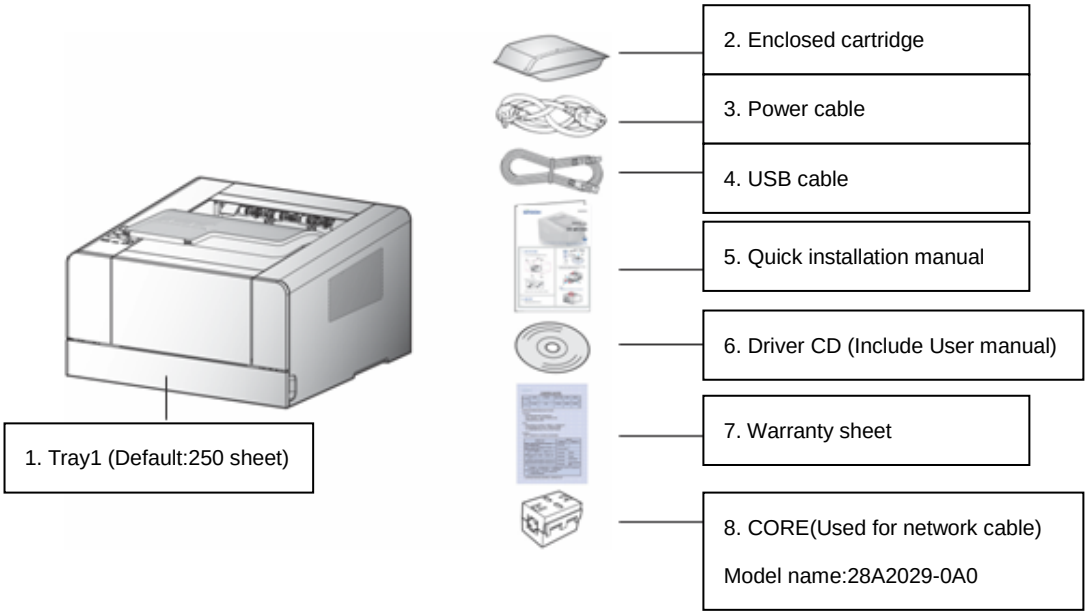
Unpacking

1. Take out the printer and all components from the box.
2. Remove tapes in and on the printer.
3. Check the printer and included components.

Included Components

No	Item No.	Item	Qty.	Remark
1	-	Basic Tray (250 Sheets)	1	A610/A615
1	-	Basic Tray (500 Sheets)	1	A611/A616
2	LA258058	AC power cord	1	220V
3	L0025703	USB cable	1	
4	-	Quick installation guide	1	
5	-	Driver CD & User manual	1	
6	-	Enclosed cartridge	1	
7	-	Warranty	1	

8	-	CORE (For network cable)		



Installing Optional Feeder (250 Sheets & 500 Sheets)

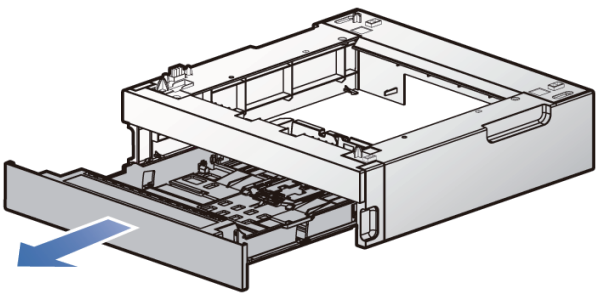
Installation

⚠CAUTION

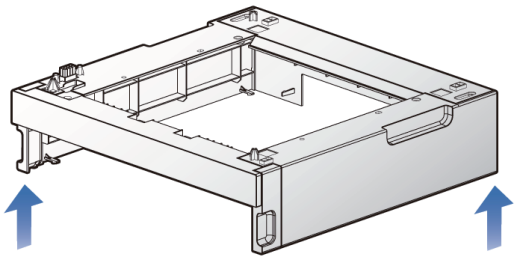
Please proceed with the followings before installing the optional feeder after the printer installation.

- Turn the printer's power off
- Remove the power cord from the printer and remove all cables from the back

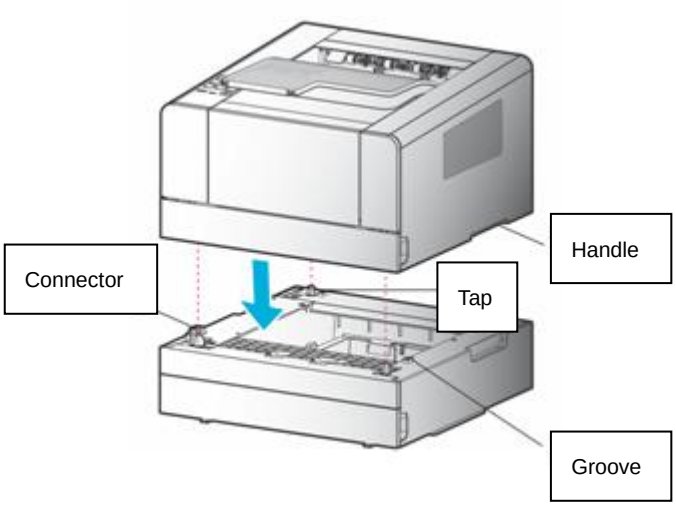
1. Remove all wrappings and tapes on the feeder.
2. Pull the feeding unit out from the feeder.



3. Hold both edges of support and place it on the printer placing location.
4. Re-install the feeder. Push it in until it completely attaches.



5. Hold both handles on the bottom sides, lift it up and place it on the placing location. Align the tab, narrow hole and connector on the top of the feeder exactly with the bottom of printer.
   Place it on the feeder and check if it is accurately on the feeder.



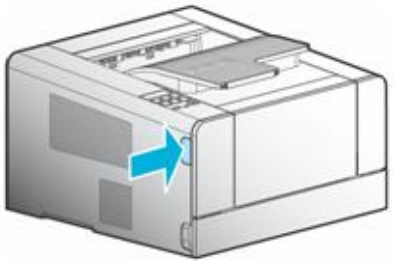
⚠CAUTION

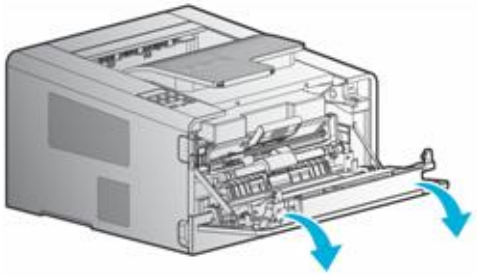
Turn OFF the printer before installing or removing optional feeder.

Image Cartridge

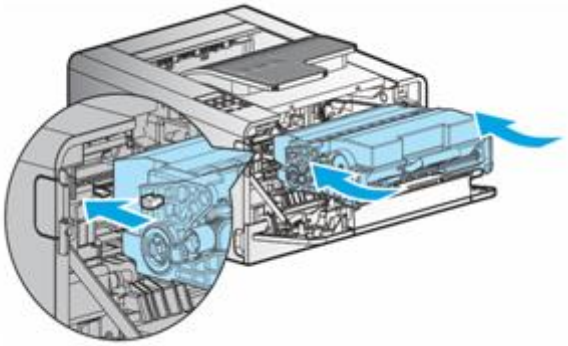
Installation

1. Open the top front cover.





2. Hold the handles of the cartridge and accurately align both front hooks (arrow stickers) with both guide grooves of the printer (arrow stickers).
3. Push in the cartridge until you hear a click inside the printer.



4. Close front cover. Check if both sides of the cover have been shut with a click.

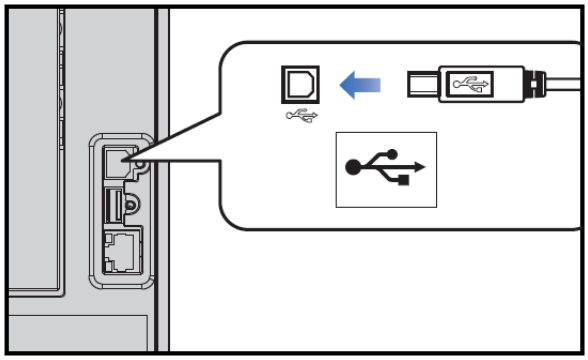
⚠CAUTION

Check if multipurpose tray's cover is closed when closing the front cover. If the front cover is closed while multipurpose feeder's cover is open, it can cause paper jam and malfunction.

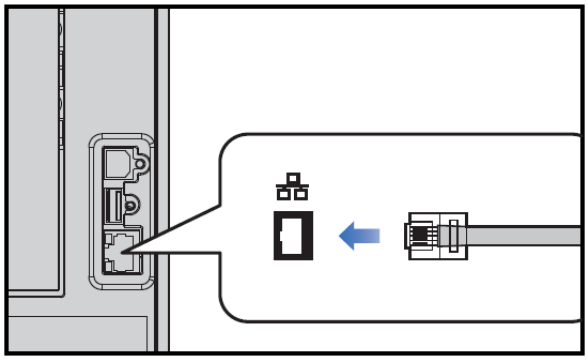
Connecting Cables

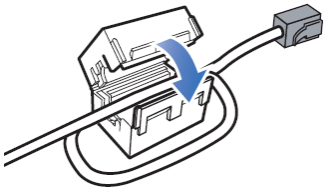
1. Check if power has been switched off from the printer, computer and other connected devices.

2. *Connect the USB cable.

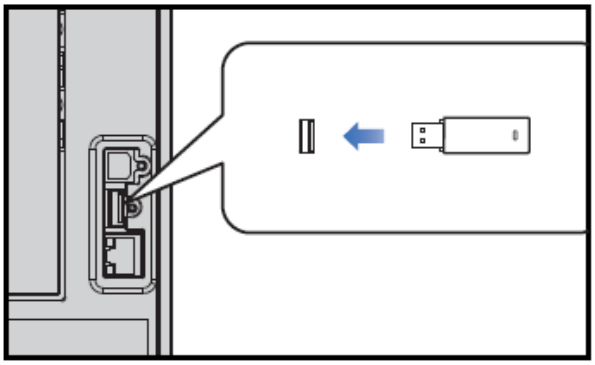


* Network Connection – Connect the enclosed CORE to the cable before connecting the network cable.





*Wi-Fi Connection (Wi-Fi Module (WN400) option)



Recognized automatically without driver installation

※ A611 is equipped with Wi-Fi and does not require a Wi-Fi Module.

Maintenance

Preventive Maintenance

User Replaceable Items

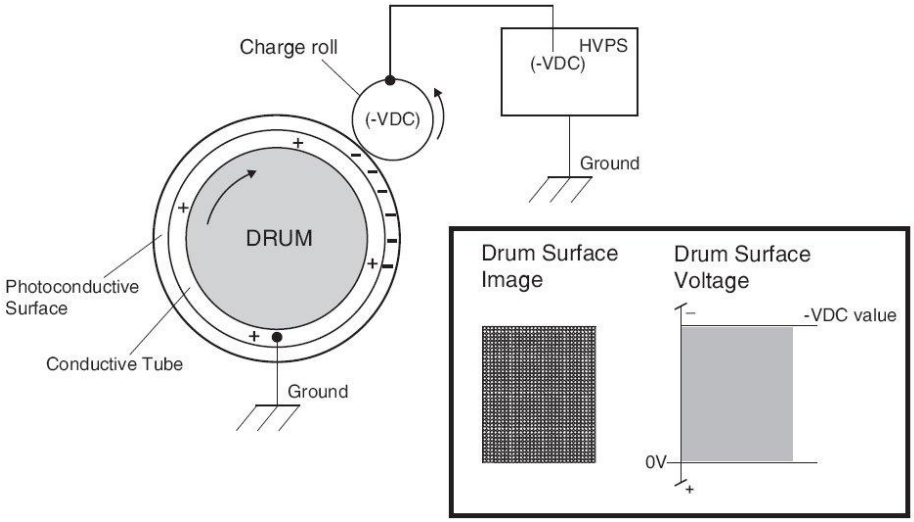
Category	Model	Item	Life
A610/A611 SER	For A610/A611	Fuser unit	120K
		Transfer roller	120K
		MPT separation pad	30K
	A610/A615	Pickup roller & separation pad	120K
	A611/A616	Feeder Accufeed roller	120K

Service life of this device is 400,000 sheets (A610)/ 600,000 sheets (A611) in years. Consumable parts have direct effect on burns and machine operation. Replace consumables as specified.

Detailed Description

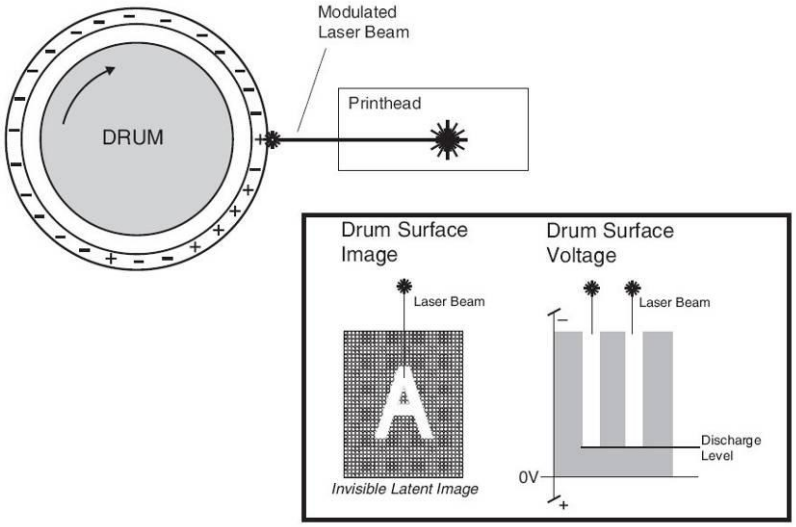
IMAGE PROCESS

Charging



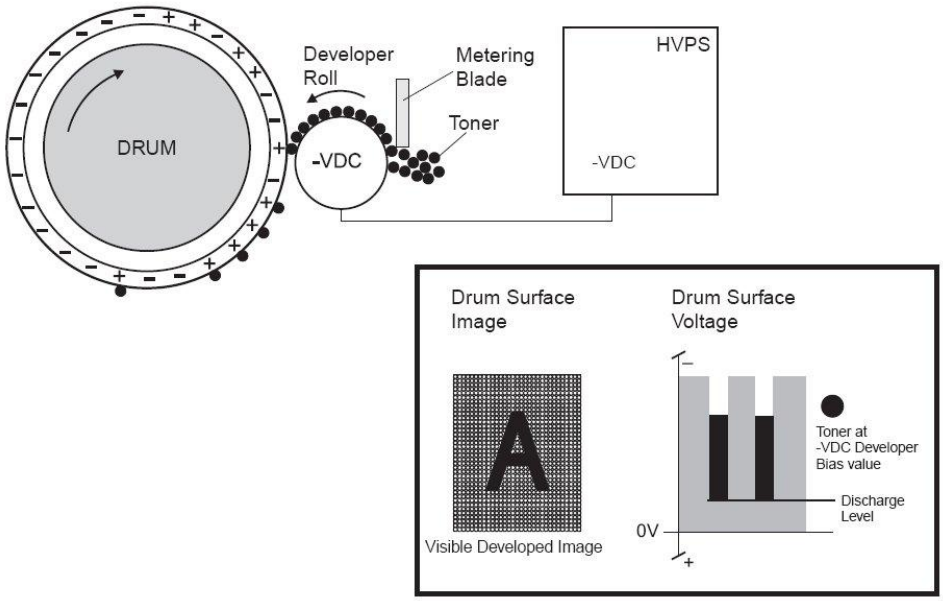
Voltage of -1540V is applied to charging roller from HVPS and the drum surface is charged with approximately -900V.

Exposure



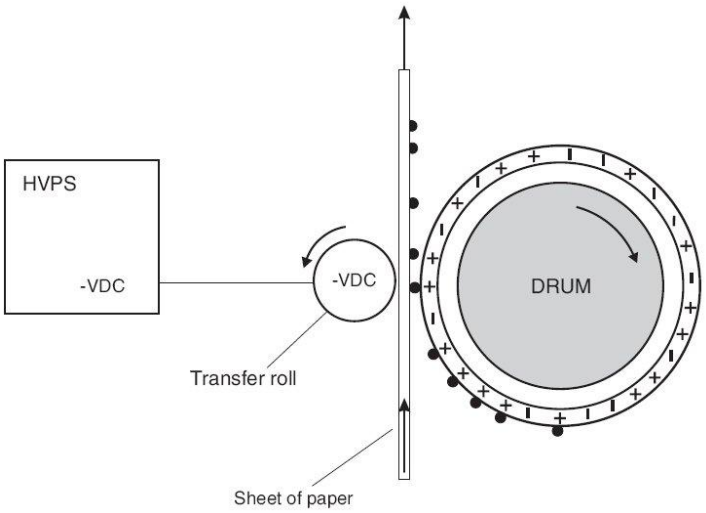
Laser scanning is performed to the image printing area and the surface electric potential of scanned area drops to about -300V to form ‘Latent Image’.

Development



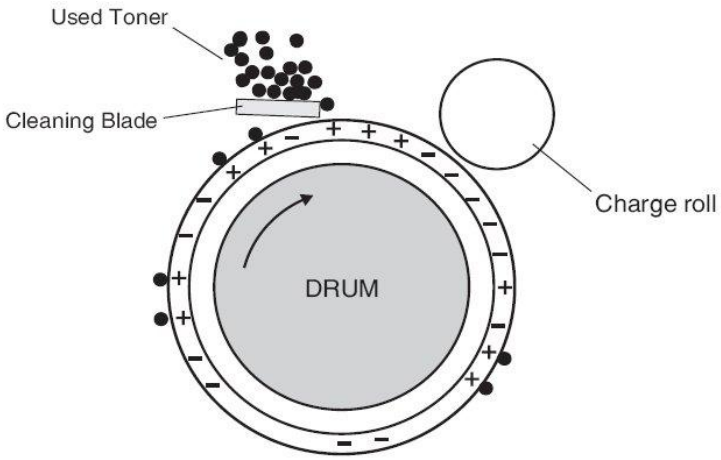
Images are formed on the drum surface by attaching the charging toner with approximately -550V via development roller and Doctor blade on the latent image area formed by laser from exposure stage.

Transfer



Images are formed by toner transfer on the drum surface from the Development stage and when paper passes, +2000V of electricity applied to the transfer roller pulls the image forming toner particles on drum surface to form unsettled images on the paper.

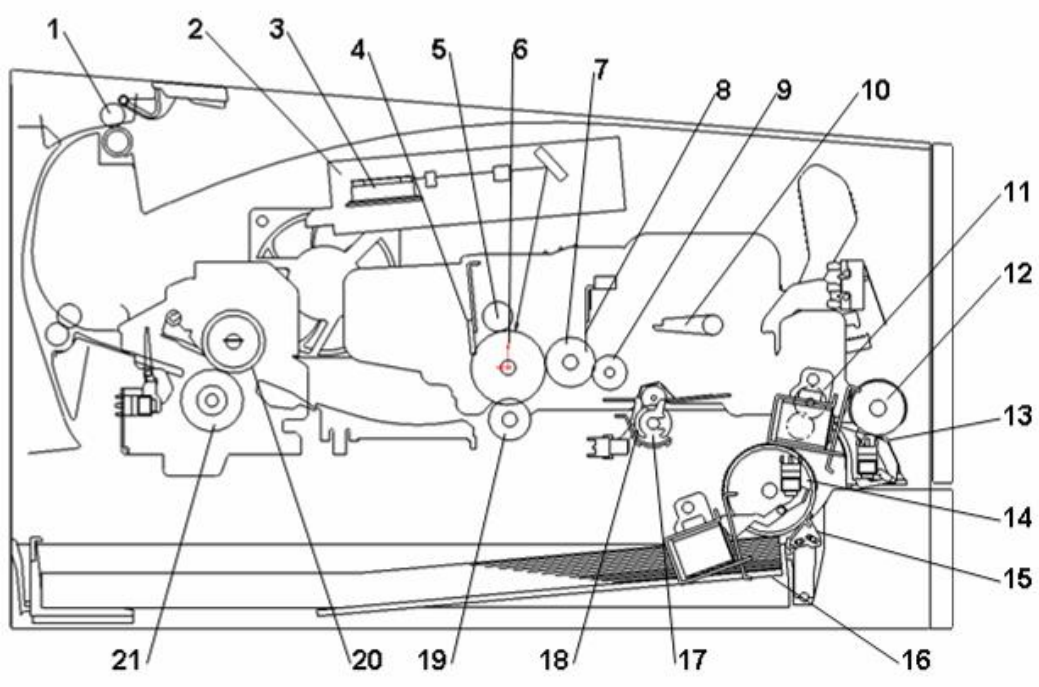
Cleaning



Remaining toner on the drum surface after transferred to paper gets trimmed by cleaning blade before getting into charging roller and gets collected in the used toner collecting space.

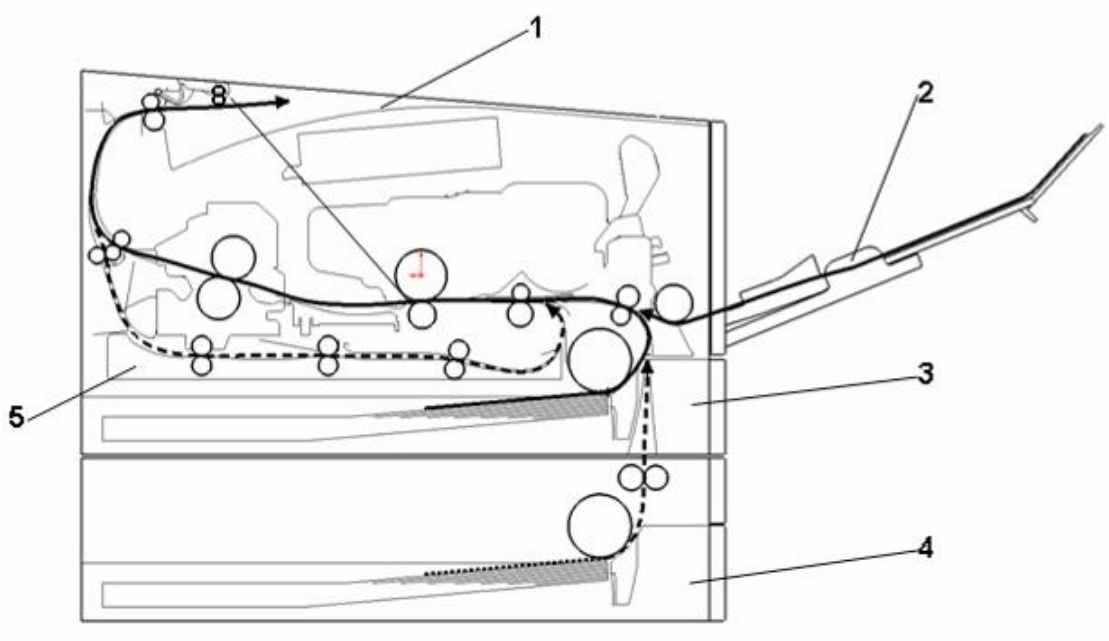
Machine Overview

Machine Components



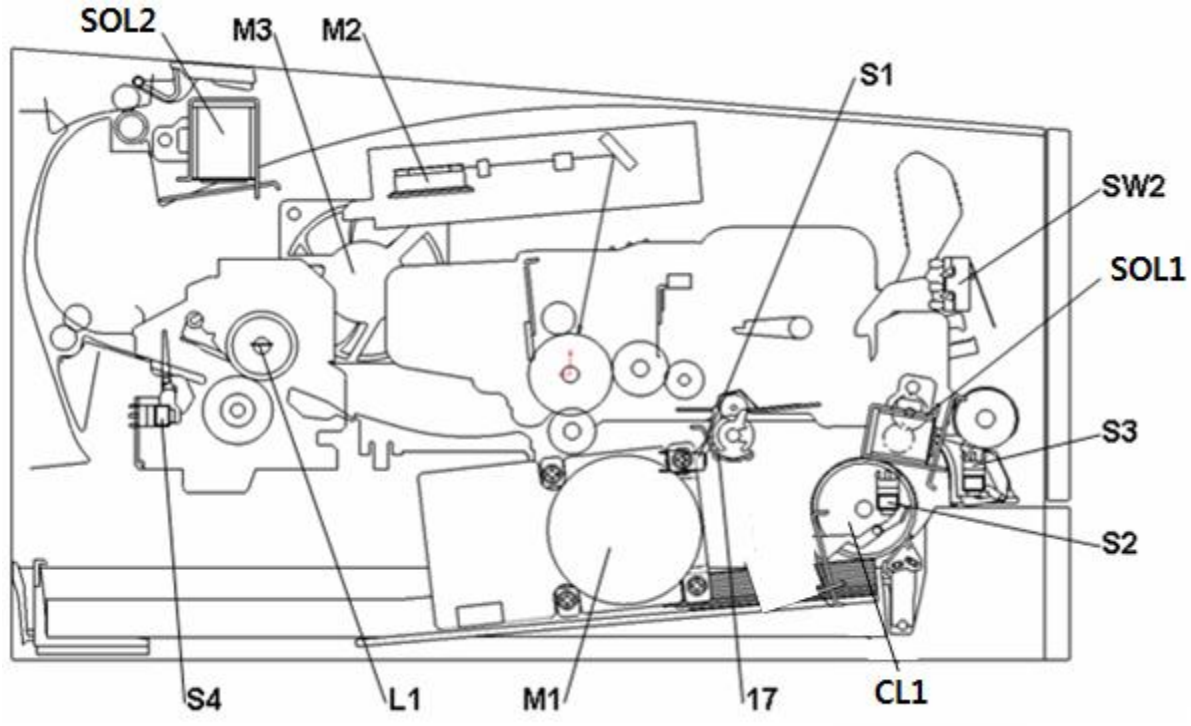
1. Output Roller
2. LSU
3. Polygon Mirror Motor
4. Cleaning Blade
5. Charging Roller
6. OPC Drum
7. Development roller
8. Doctor Blade
9. Add Roller
10. Paddle Roller
11. Mid Roller
12. Multipurpose Tray Feed Roller
13. Multipurpose Tray Friction Pad
14. Tray 1 Feed Roller
15. Tray 1 Friction Pad
16. Tray 1 Base Plate
17. Resist Dam
18. Resist Roller
19. Transfer Roller
20. Fusing Hot Roller
21. Pressurize Roller

Paper Path



1. Output Bin
2. Multipurpose Tray
3. Main Feeder
4. Optional Feed Unit
5. Duplex Unit

Electrical Components

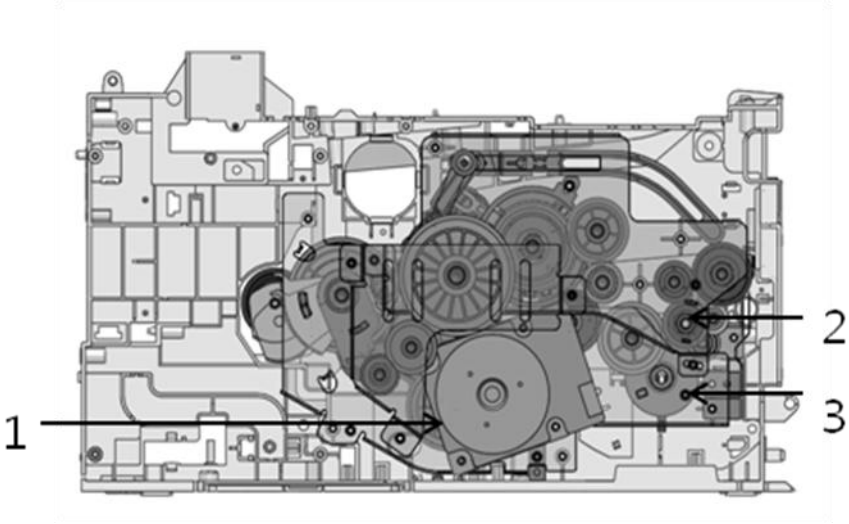


Symbol	Name	Function
Motor		
M1	Main	Operates main body
M2	Polygon mirror	Rotates polygon mirror motor
M3	Exhaust fan	Cools heat around fuser unit
Switch		
SW1	Power	Supplies power to the machine. If this is turned off, no power will be supplied to the machine (Located on the bottom right on the back of the machine)
SW2	Front Cover	Detects opening of front cover and isolates +3.3VLD and +24V dc power line.
Sensor		
S1	Paper feed	When printing, detects paper entrance and allows images to be formed on OPC drum. Detects miss feed/paper jam

Symbol	Name	Function
S2	Feeder Empty	When there's no paper on the tray, notification will be transferred to the CPU
S3	Multipurpose tray empty	When there's no paper on the tray, notification will be transferred to the CPU
S4	Paper Feed	Detects paper jam

Symbol	Name	Function
PCBs		
PCB1	System	Directly and indirectly controls all applications via other control boards.
PCB2	PDU (Power supply unit)	Supplies AC power to Fusing lamp and optical heater and DC power to the system.
Solenoid		
SOL1	Multipurpose Tray feeding	Controls multipurpose Tray's feeder roller operation
SOL2	Duplex Unit	Controls Duplex Unit's operation
Lamp		
L1	Fusing Lamp	Applies heat to Hot Roller.
Others		
TS1	Thermostat	When Fusing unit is overheated, the Fusing Lamp circuit gets opened (Located on top of Fusing Hot roller)
TH1	Thermistor	Detects temperature of Hot roller. (Located on top of Fusing Hot roller)
Electromagnetic Clutch		
CL1	Tray feeding	Controls Tray's feeder roller operation

Drive Chain

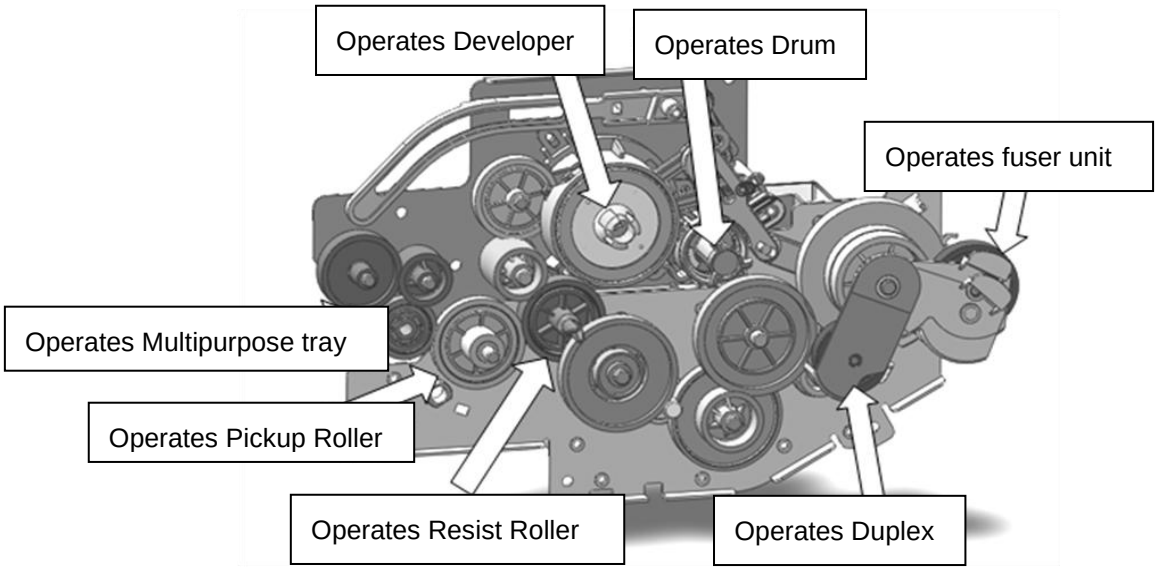


1. Main Motor
2. Multipurpose Tray Feeding Solenoid
3. Electromagnetic Feeding Clutch in Tray

Main Driving Gear Units

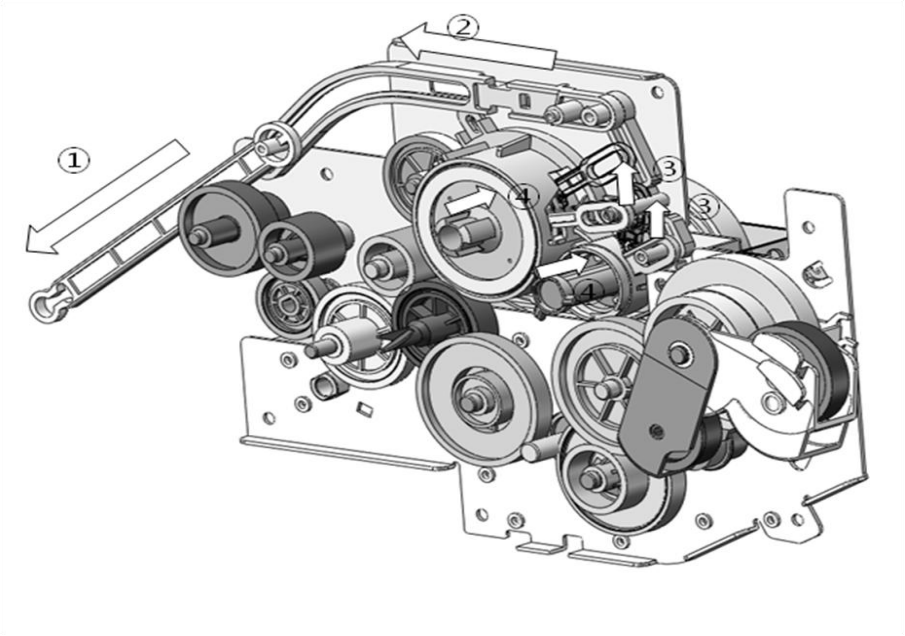
Main Driving Gear Unit Components

The machine has one main motor and the rotation of this motor is delivered to the train of gears composed with various gears to operate developer/drum, manual feeder, fusing unit, duplex unit, resist roller and pickup roller.



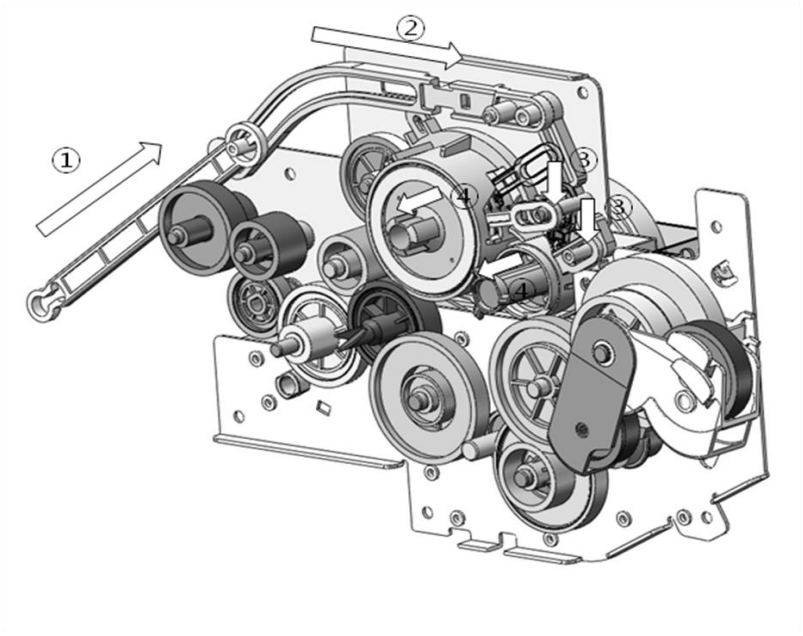
Installing/Removing Image Cartridge

1. Front cover open



When machine's front door is opened, the link connected to the front door moves in the direction of 1. Lever no.2 moves consecutively by the moving link, and the Oldham lever and dog-bone lever each pull the coupler, disconnecting from the cartridge.

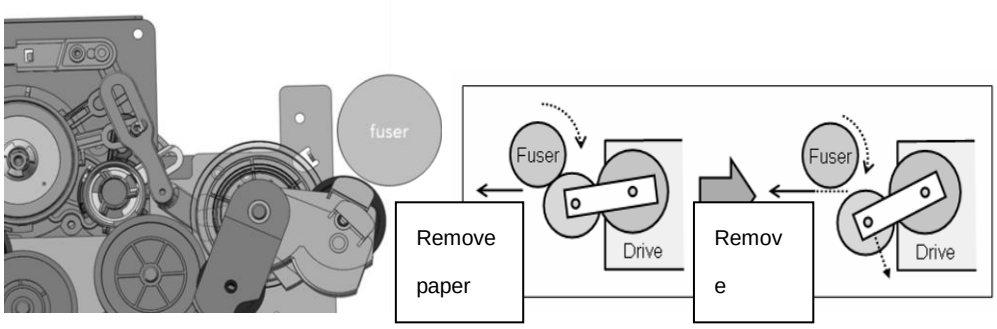
2, Front cover closed



When the front door of the machine is closed, Link 1 connected to the front door moves in the direction of 1. Lever no.2 moves consecutively by the moving link, and the Oldham lever and dog-bone lever each push the coupler, connecting to the cartridge.

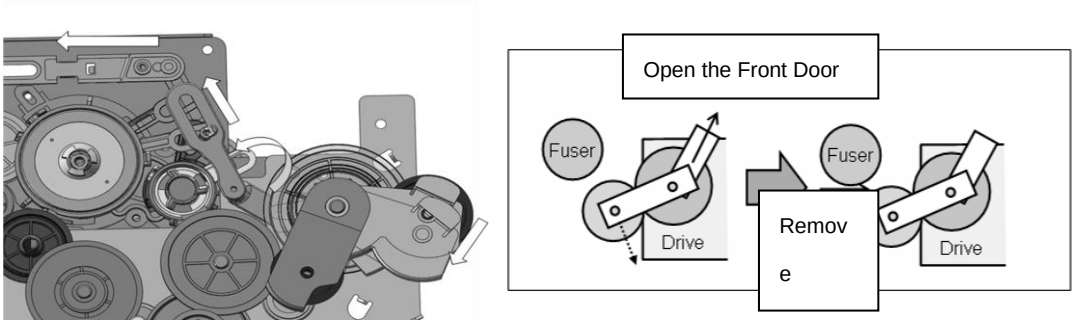
Removing Fusing Paper Jam

1. Removing paper from back of fuser unit



Gear link is pushed to the back, disconnecting gear and allowing jammed paper to be removed.

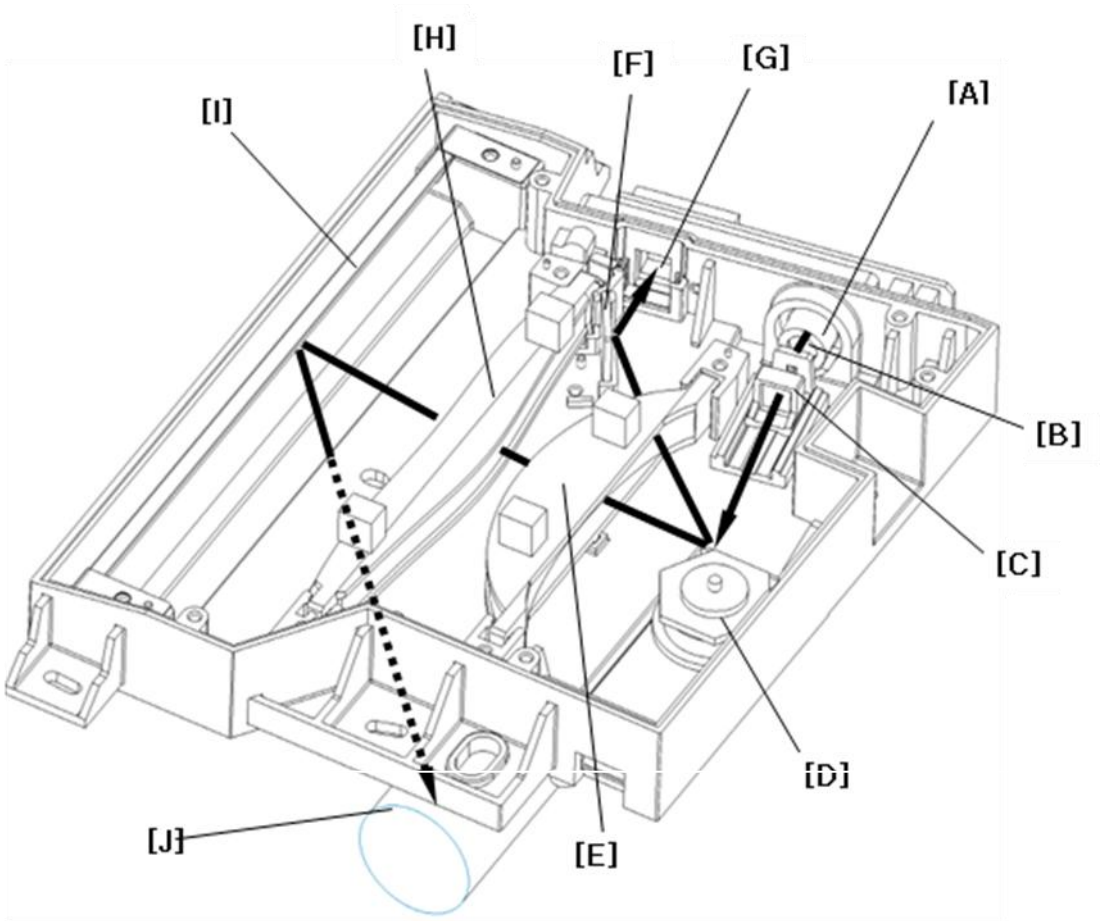
2. Removing paper from front part of fuser unit



When the front door is opened, the link connected to the front door disconnects gears, allowing jammed paper to be removed easily.

Laser Unit

Structure and Optical System Path



A : Laser Diode Unit	F : Synchro Reflection Mirror
B : Collimator Lens Unit	G : Synchro Detect Sensor
C : Cylindrical Lens	H : #2 F-theta lens
D : Polygon Mirror Motor	I : Reflection Mirror
E : #1 F-theta lens	J : OPC Drum

Laser Diode Unit: Generates laser beam

Collimator lens: Converts dispersed laser beams to straight beam

Cylindrical Lens: Concentrates sub-scanning directions of laser beam into one point

Polygon Motor: Alters laser's direction to main direction

#1, #2 F-theta lenses: Alters BEAM angle so that beams of same size are equally scanned on the DRUM surface

Reflection Mirror: Alters laser's direction

Synchro Detect Sensor: Determines the scan starting position

LSU

Laser Safety

CDRH (Center for Devices and Radiological Health) prohibits laser unit repairing on a field. A laser unit can only be repaired in a factory or necessary places. A laser unit can be replaced with qualified customer service technician and internal parts of laser unit cannot be replaced on a field. Therefore, the customer service technician is to return the laser unit to a factory or service center if laser unit's parts require replacements.

LSU Information

LSU Manufacturer: OSS CO., LTD..

LSU Form No.: SDH-LSU-A4001

LD Manufacturer: QSI

LD Form No.: QL78F6DF

LSU NOTICE

This machine is approved by US for in compliance with DHHS21 CFR Subchapter J regulations for class 1 laser products, and IEC 60825-1 regulations in other countries as well.

Class 1 laser products are considered safe. This machine uses 770~795 nm (L model) and 770~800 nm(M/H model) frequencies and 5mW(L model) and 15mW(M/H model) output of one AIGaAs laser diode (L model) and two AIGaAs laser diodes(M/H model).This system and machine are operating properly, but designed to not to allow accesses to class 1 laser emission under maintenance or regulated service conditions.

⚠WARNING

Please turn the main power switch off before performing procedures in laser unit. Laser can cause severe eye damage.

⚠WARNING

Performing controls, adjustments or procedures other than said from this manual can cause severe radiation exposures.

Image Cartridge

Overview

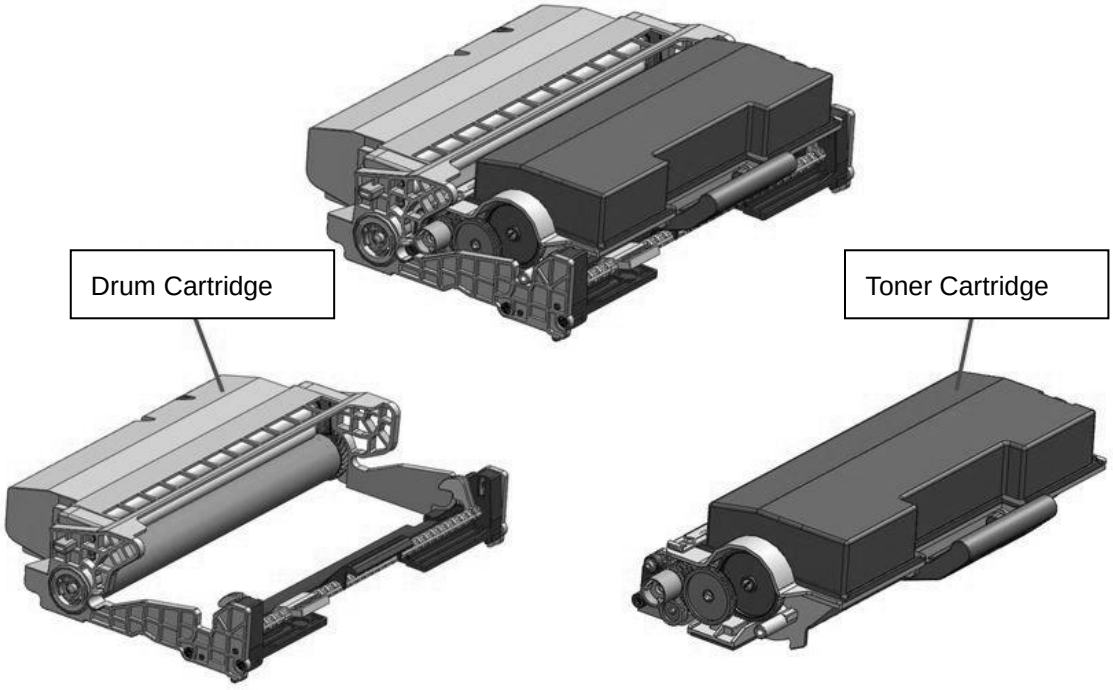
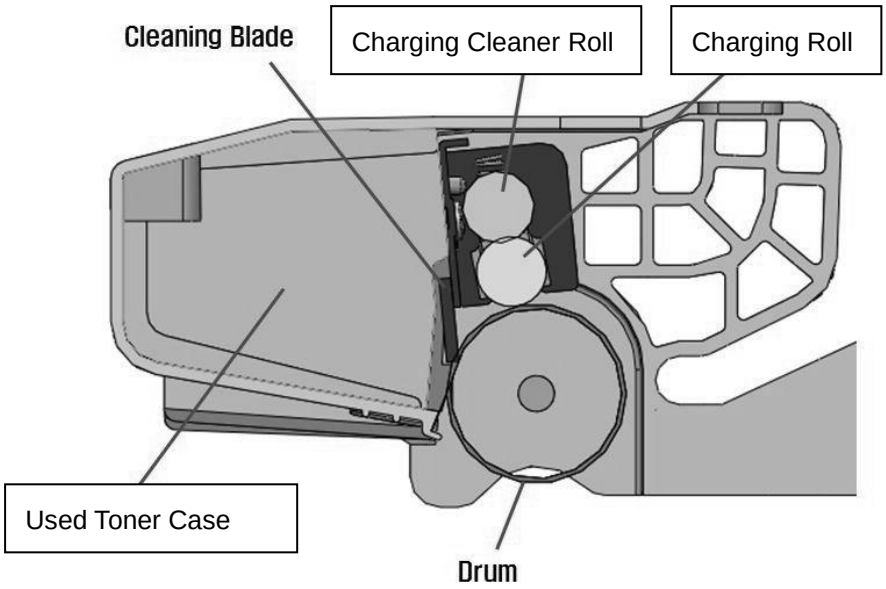


Image cartridge is composed with drum cartridge and toner cartridge as shown above and can be separated.

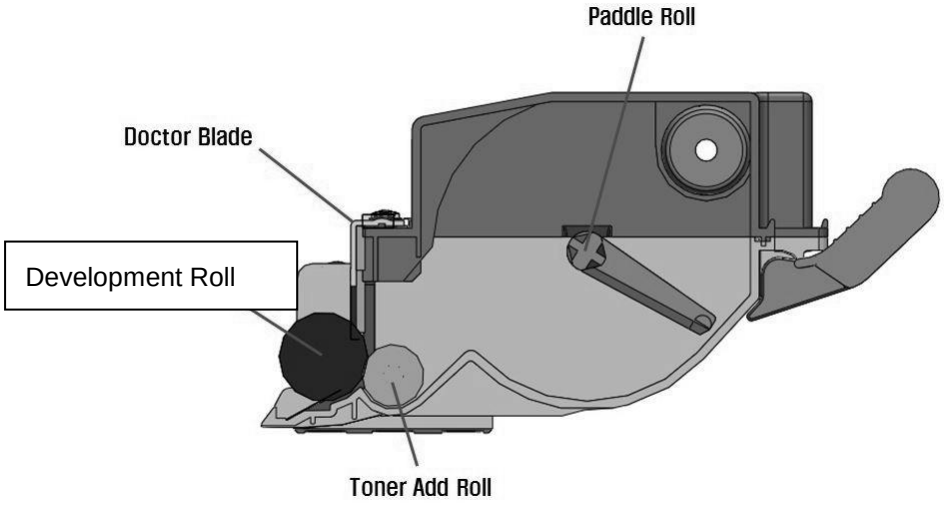
Drum cartridge does not have a separate chip, but toner cartridge has a separate information chip to store toner counter and manufacturer information. The machine refers to the information on the chip to determine toner replacing period and auto toner counter reset.

Drum Cartridge Component



Drum cartridge consists of a drum, charging roller, cleaning blade, and a compartment for collecting used toner.

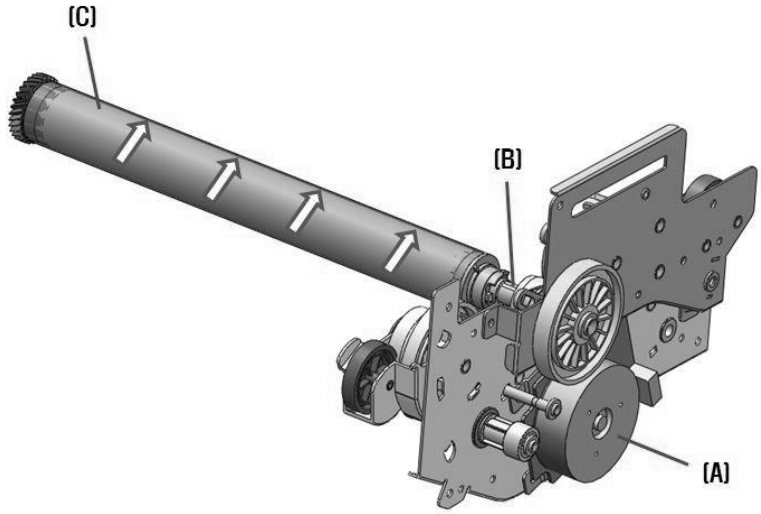
Toner Cartridge Components



A toner cartridge consists of a Development roller, Add roller and a Doctor blade as shown above and has a Paddle roller carrying toner to add roller.

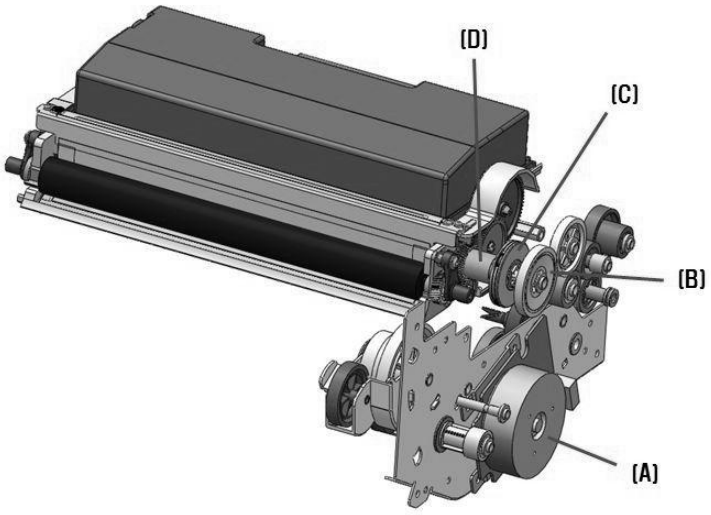
Doctor blade allows toner supplied to Development roller surface by Add roller to be applied equally on the Development roller.

Drum Cartridge Drive



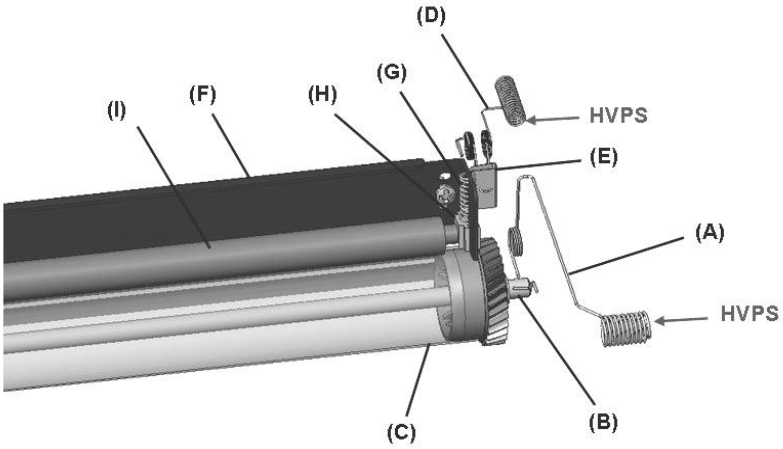
Drum cartridge's drum rotates by delivering the motor's driving force generated by the rotation of main motor (A) to drum (C) via drum driving gear (B)..

Toner Cartridge Operation



When the driving force of main motor (A) is delivered to development coupler driving gear (B), the Oldham type coupler (C) rotates. As a result, the driving force of the main motor is ultimately delivered to the Idle coupler gear (D) in the toner cartridge. With the driving force delivered Idle coupler gear's rotation, the attached development roller, Add roller and Paddle roller are rotated.

Drum Cartridge's Applied Voltage

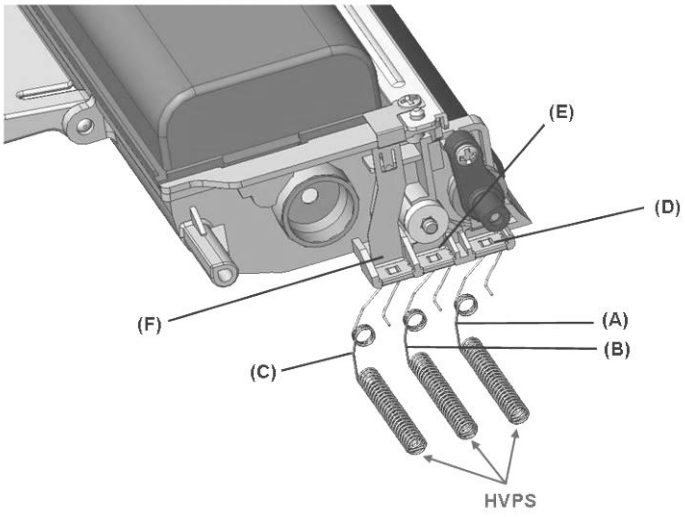


Charged voltage of -1540V is applied to the charging roller (I) contacting Drum (C).

The charged voltage is applied to the cleaning blade BKT (F) from HVPS via charging voltage applied spring (D) and charging voltage applied plate (E), and this applied voltage is delivered to charging roller again via charging roller spring (G) and conductive roller bushing (H). Drum surface gets charged with about -900V with this charged voltage.

Also, -200V of core voltage is applied to drum and this voltage is delivered to drum surface via drum voltage applied spring (A) and Drum shaft (B) from HVPS. This core voltage is applied to give more smooth image on half-tone images and somewhat prevents dual image occurrences due to remaining toner without a separate per-transfer lamp.

Toner Cartridge's Applied Voltage



Three types of voltages are applied to a toner cartridge. The necessary voltage is applied to development roller via development applied voltage spring (A) and development roller plate (D), and to add roller via add voltage applied spring (B) and add roller plate (E), and to doctor blade via DB voltage applied spring (C) and DB plate (F).

Toner Cartridge and Drum Unit Replacement

Drum Unit

A drum cartridge's life is based on A4, 5% chart and was calculated based on the printing conditions and actual number of prints. When the number exceeds 45,000 sheets, the message "Replace Drum Ctg" is displayed on the printer. When the number exceeds 50,000 sheets, you can no longer print. If you reset the drum cartridge instead of replacing it with a new one, you may be able to continue using the old drum cartridge but the printing quality cannot be guaranteed.

Toner Cartridge

Like a drum cartridge, a toner cartridge is calculated based on the A4, 5% chart and based on LSU dot count or the set concentration level. When 3K/6K toner has reached 2.5K/5.5K respectively and 9K/13K has reached 8K/12K respectively, Toner Low message is displayed, alerting the user that the toner is about to expire and giving the user to purchase a new toner before the toner runs out. After this message, you can make additional prints of "**Guaranteed life + 1000 sheets**". When 3K toner reaches approximately 4K according to the 5% chart, "TONER CARTRIDGE CHANGE" is displayed, meaning you can no longer print and must purchase a new cartridge. Likewise, "TONER CARTRIDGE CHANGE" is displayed when 6K has reached 7K, 9K has reached 10K, and when 13K has reached 14K. You will no longer be able to print.

Paper Feed (A610DN)

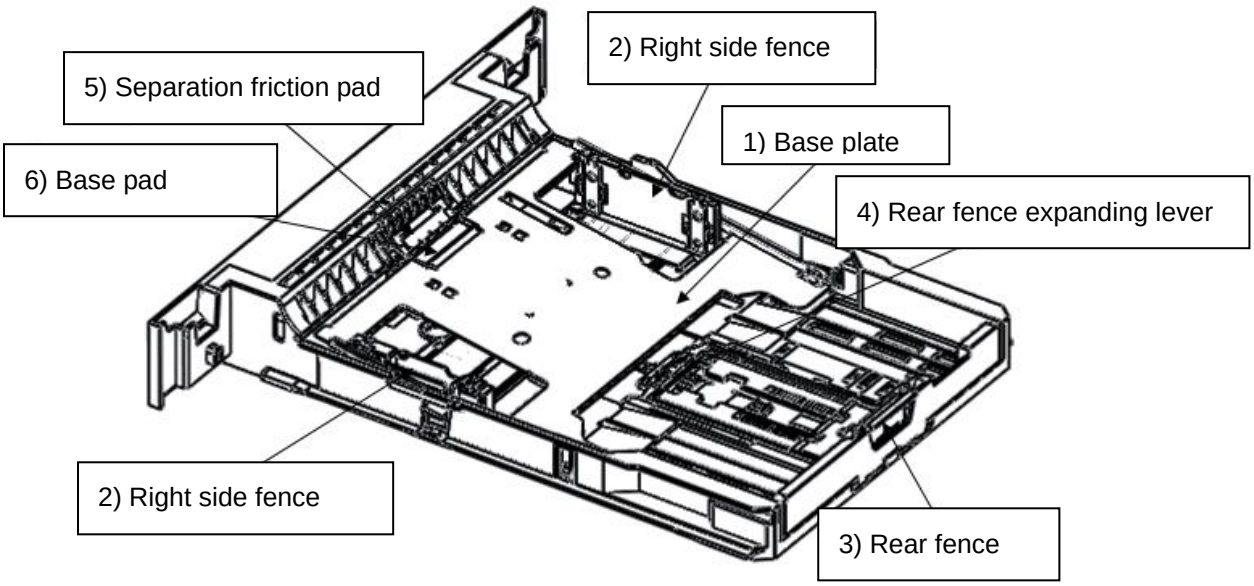
Overview

The printer is installed with a 250 sheets of A4 cassette Tray with 75gsm as base and a bypass tray as the base and 250 sheet feeding unit can be added optionally.
A friction pad method is used as paper separating method for main tray and a paper detecting sensor is mounted to determine paper presence, but a separate auto paper size detecting sensor is not installed, which allows the printer to detect the paper size by on-off timing of Resist sensor.
When loading papers to main tray, adjust the side fences and rear fence to prevent gaps in the cassette.
For thick papers (28lb, 105g/m^2) and special papers, there is a load limit line indication.

Main Tray Components and Feeding and Separating Mechanism

Main Tray consists of the following 6 components. Role of each component is specified below.

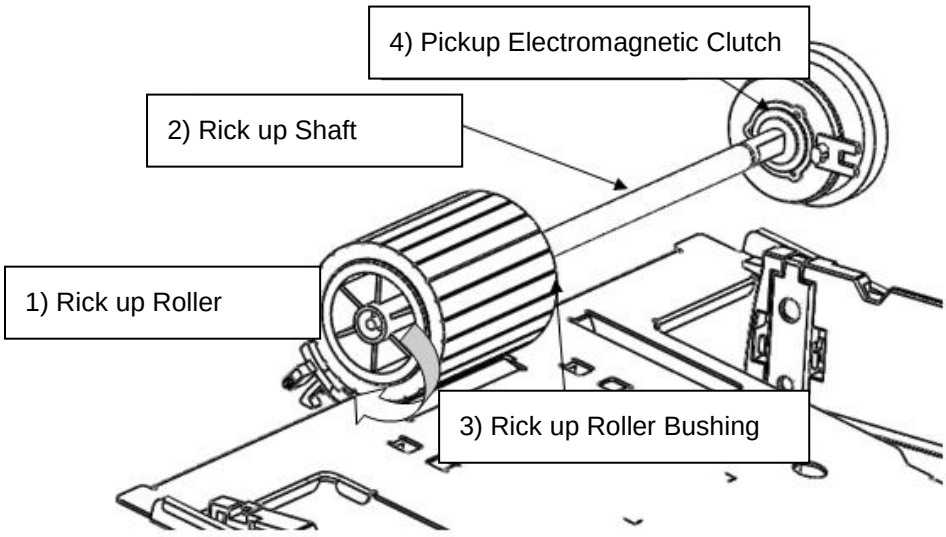
1) Base Plate: In the cassette tray for loading paper. It lifts paper in the tray with the pickup roller of the main body and applies adequate pressure between the roller and paper.
2) Left and Right Side Fences: Aligns the loaded papers to its size.
3) Rear Fence: Aligns the rear side of loaded papers to its size.
   Move the rear fence lever to adjust.
4) Rear Fence Expanding Lever: Used to expand the rear fence when loading legal papers.
5) Separation Friction Pad A'ssy: Separates sheets fed from tray one by one.
6) Base Plate Pad: Holds the bottom paper down and separates sheets to prevent several sheets being fed at once when low on paper.



Main Body's Pickup Part Components and Driving Mechanism

The main tray consists of the following 4 components. Role of each component is specified below.

1) Pickup Roller: Uses tray's feeding pressure to pick up paper.
2) Pickup Shaft: Delivers driver from the segment gear to the pickup roller.
3) Pickup Roller Bushing: Holds the pickup roller's position from both ends of picku p roller.
4) Pickup Electromagnetic Clutch: The electromagnetic clutch operates at the time of feeding and connects the pickup roller and drive.



Main Feeder Drive

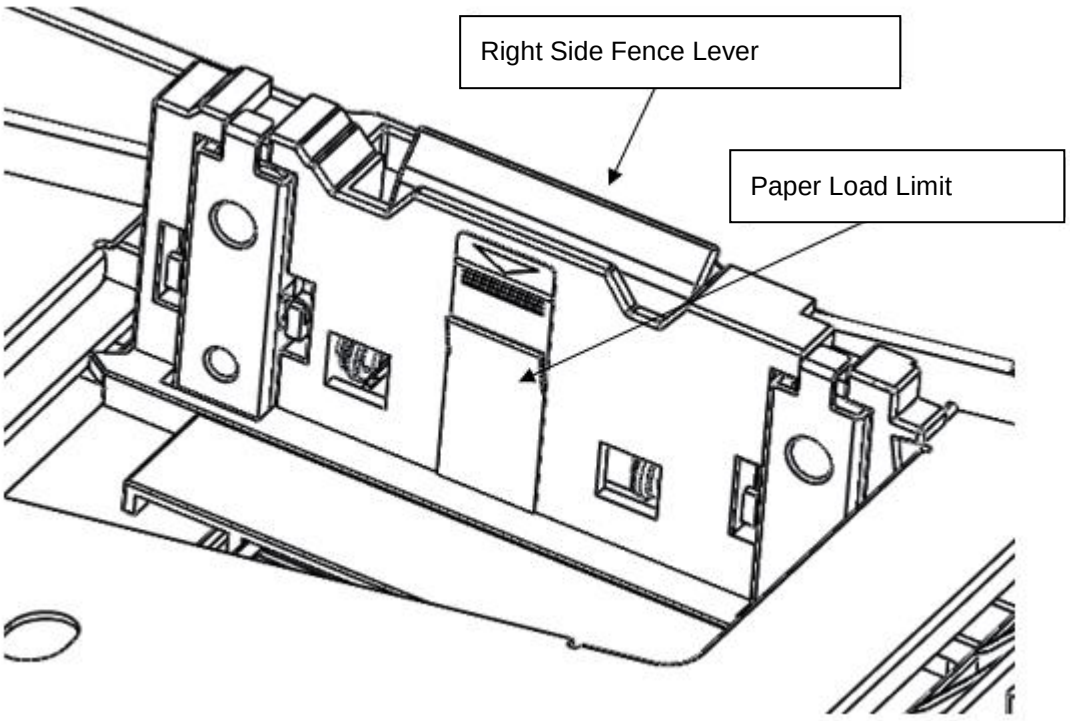
When you open the cassette tray, load paper and close it again, the base plate is unlocked, lifting paper towards the pickup roller. Feeder is now ready to feed paper. When the feed signal is entered in the main body, the electromagnetic clutch is activated, the pickup roller rotates and the topmost paper is pick up and moved towards the main body.

The front part of the paper fed by the feed pressure between the pickup roller and the base plate is rubbed against the friction pad, and by this paper is separated and fed one sheet at a time.

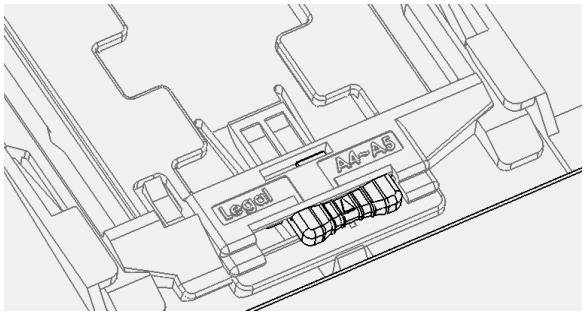
The front part of a paper is fed up to the transfer roller when the pickup roller rotates at 470m/sec. That paper is then fed through the transfer roller and the resist roller. When the pickup roller has been activated by paper feeding but paper failed to be fed into the transfer roller, the pickup roller rotates once more to pick up the paper.

When the tray has fed all the paper inside, the paper detection sensor operates and displays a Paper Low message.

Side Fence/Rear Fence Controls

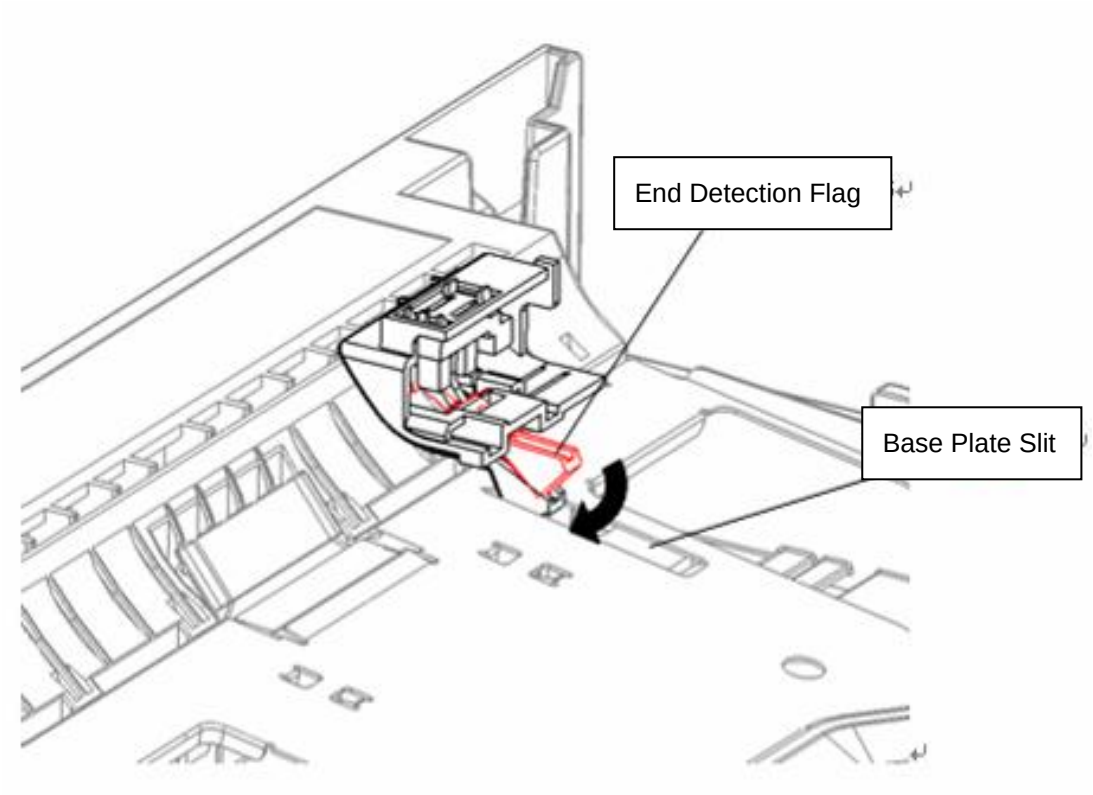


Hold right side fence lever and right side fence to move the side fence. Load paper up to the paper load limit on the side fence. Reusable paper can be categorized as Special Paper because of its curl.



Hold the rear fence lever to move the rear fence. Legal paper in particular must have the rear fence wall expanded. In this case, set the rear fence expansion lever to Legal size. When loading A5~A4 paper, reset the expansion lever and move the rear fence wall inward.

No Paper Detection



When the cassette tray becomes empty, the paper detection sensor flag drops to the slit in the base plate. The sensor flag blocks the path of the light from the transmitter to the receiver, altering the sensor output value. The printer detects whether there is paper in the tray by this change in the sensor.

Paper Jam Detection

If the pickup roller fails to turn on the input sensor after having rotated once, it rotates one more time. If paper fails to turn on the input sensor even after the pickup roller has rotated twice, the printer determines that there is a paper jam (or miss-feed) and alerts the user.
This printer does not have an automatic paper size detection sensor. Paper size is detected by the on-off timing of the registration sensor at feeding. Paper will be jammed also when the detected paper size does not match the size set on the PC.

Paper Size Detection

A610 does not have a Paper Size Detection Sensor. Select the size in the driver.

Paper Feed (A611DN)

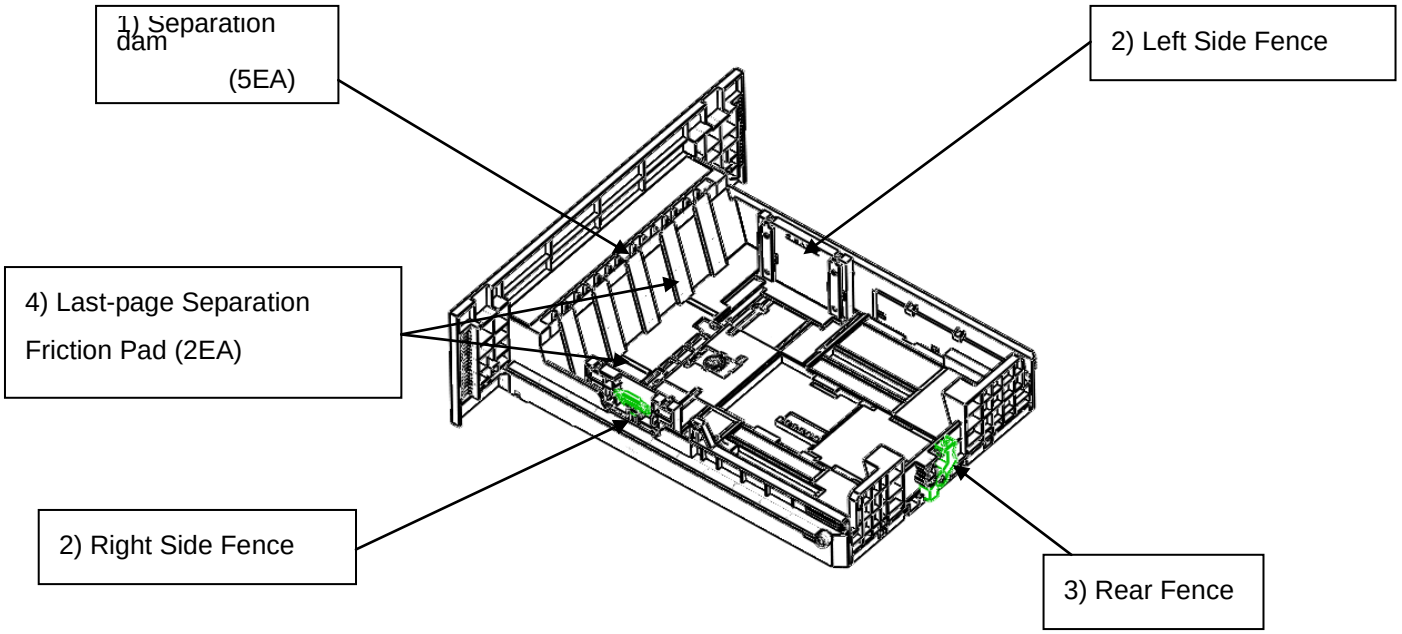
Overview

KARA-S and the 500 sheet option both use Accufeed method to feed paper. 500 option and KARA-S cannot share the same feeding tray.
KARA-S is equipped with a 75gsm cassette tray with a capacity of 500 A4 sheets, and with the 500 option you can install two 500-sheet feeders in addition.
Remaining paper detection sensors are installed (2EA), allowing you to see the tray's paper status. An automatic paper detection sensor is installed to automatically detect the size of the paper.
When loading paper in the tray for the 500-sheet option or in KARA-S, adjust the side and rear fences to fit the paper size in order to prevent gaps within the cassette.
Paper loading limits for thick or special paper are specified separately.

Input Tray Composition and Mechanism

The main tray in the 500-sheet option KARA-S consists of 4 components. Each component has the following roles.

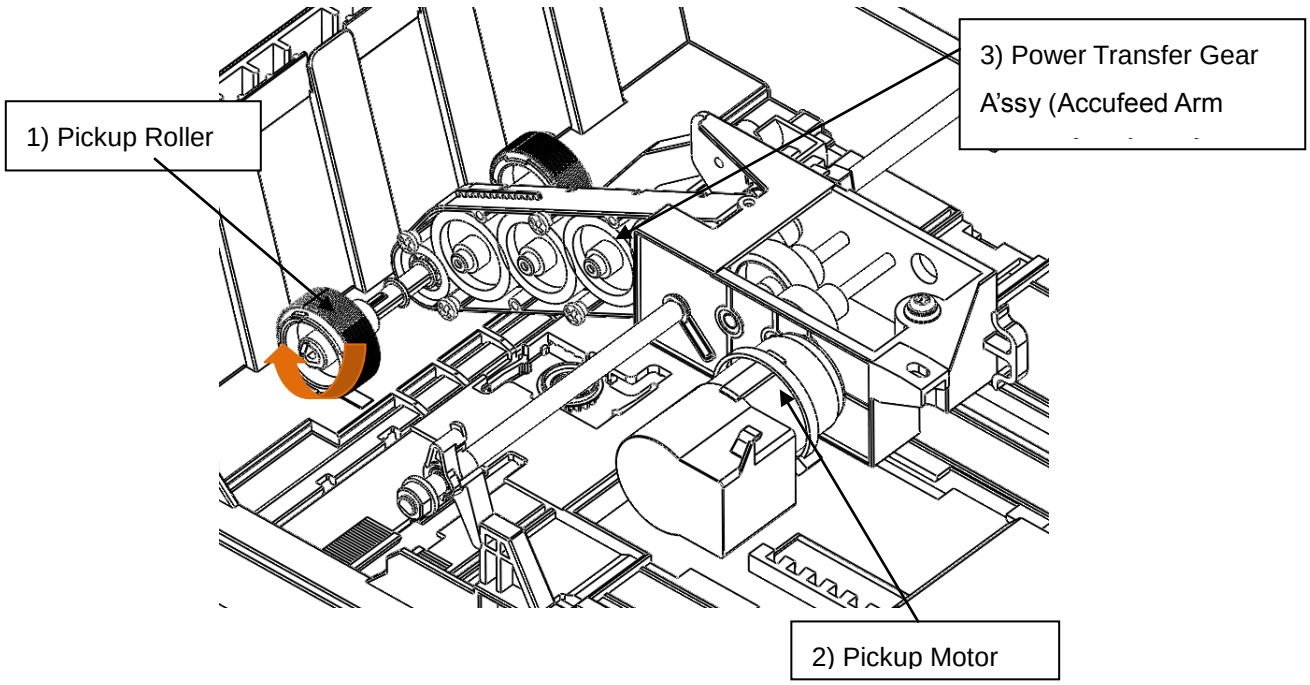
7) Separation dam: Separates paper fed from tray one at a time.
8) Left & right side fences: Aligns paper left and right in the tray.
9) Rear fence: Aligns back of paper loaded in the tray. To adjust position, hold rear fence lever and move to fit the paper.
10) Last-page separation friction pad: Holds last piece of paper down so that when there are two sheets remaining in the tray, it prevents both sheets from being fed at once.



Pickup Part Components and Mechanism

The pickup part consists of the following 3 components. Role of each component is as follows.

5) Pickup roller: Picks up paper using tray's feeding pressure.
6) Pickup motor: Supplies power for pickup roller rotation and adjusts feeding speed by setting the timing.
7) Power transfer A'ssy (Accufeed arm A'ssy): Positioned between pickup motor and roller to transfer power from the pickup motor.

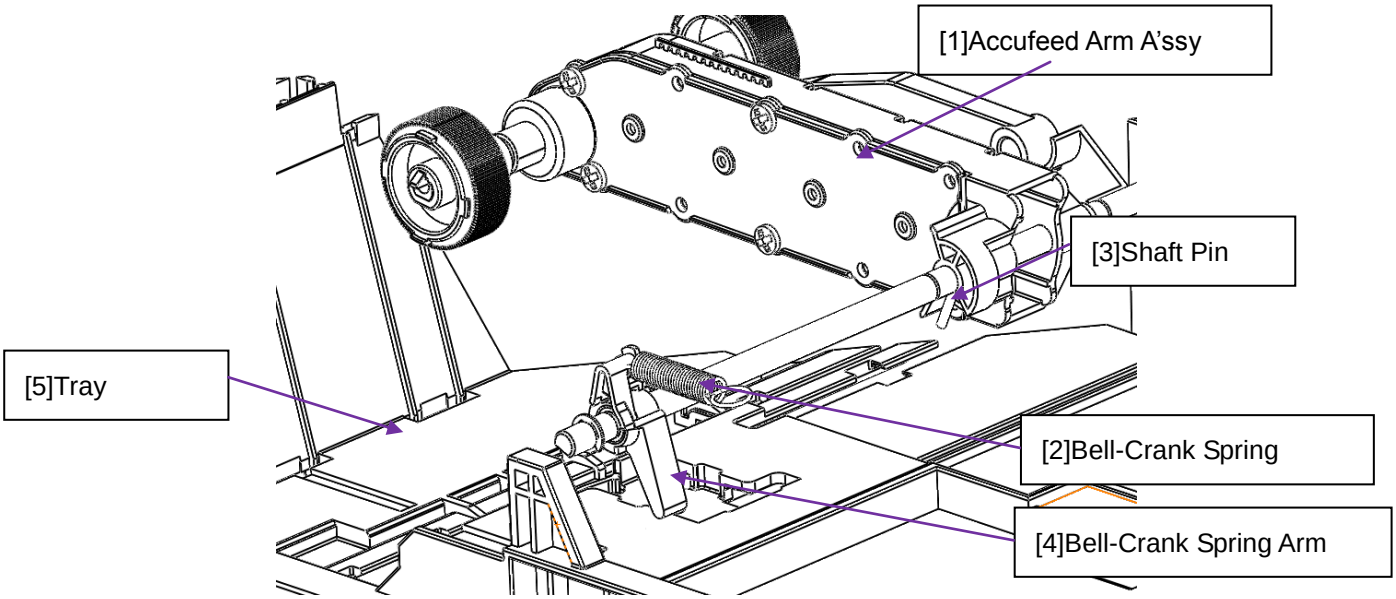


Mechanism for Opening/Closing Tray

For the 500 option, when the main tray of KARA-S is opened and paper is loaded, the Bell-crank spring [2] pulls the Bell-crank spring arm [4]. The shaft pin [3] connected supports Accufeed arm A'ssy [1] and holds it in place.

When the loaded tray is closed, the structure of the tray [5] presses the Bell-crank spring arm [4] and no longer supported by the shaft pin [3]. Accufeed arm A'ssy [1] falls automatically, making the pickup roller fall onto paper..

Paper can be fed after this process.



Feeding/ Transfer Mechanism

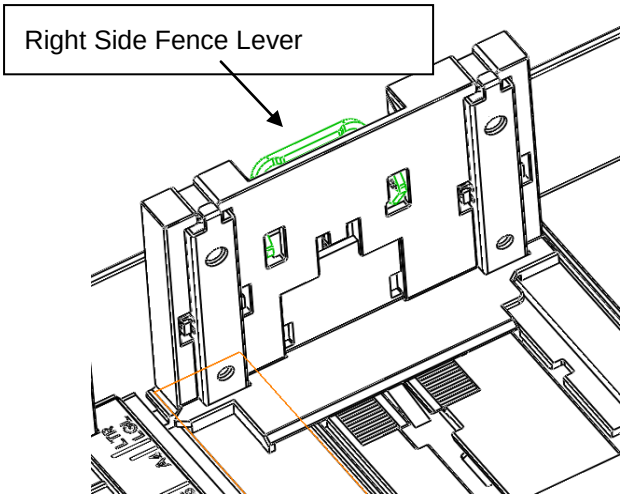
When a feeding signal is entered from the main body, the pickup motor of the selected tray begins to operate. The pickup roller rotates, picking up the top sheet into the main body. Paper fed by the feeding pressure during Accufeed arm A'ssy operation is separated in the separation dam, and paper is fed one at a time.

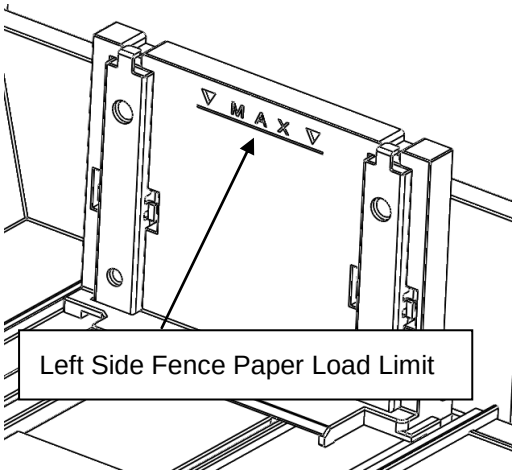
The pickup roller rotates, feeding the front part of the paper to the transfer roller. Paper is then fed through the transfer roller, past the mid roller in the main body. The pickup roller rotates up to the number of encoded rotations set each time.

If the pickup roller has begun operating by paper slip or other feeding condition but failed to feed paper into the transfer roller, the pickup roller picks up paper twice more.

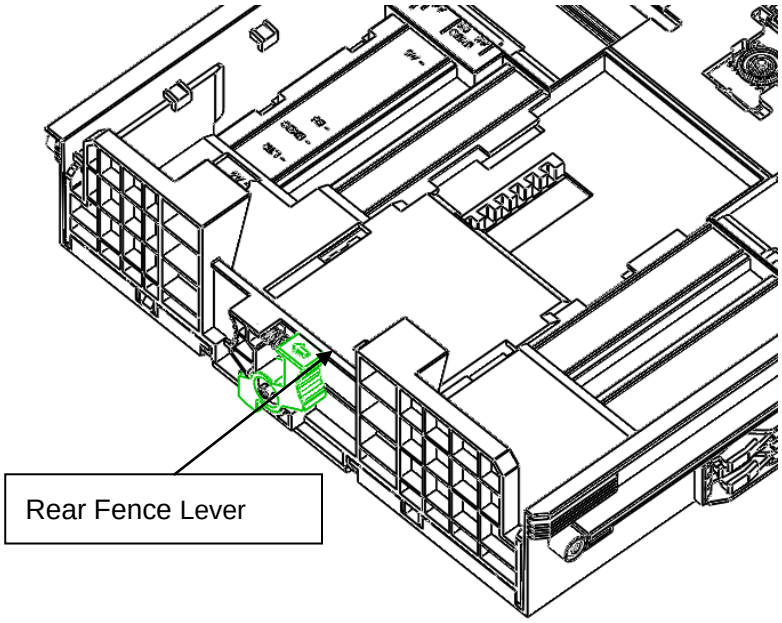
When the tray has fed all the paper inside, the paper detection sensor operates and displays a Paper Low message.

Side Fence/Rear Fence Operation



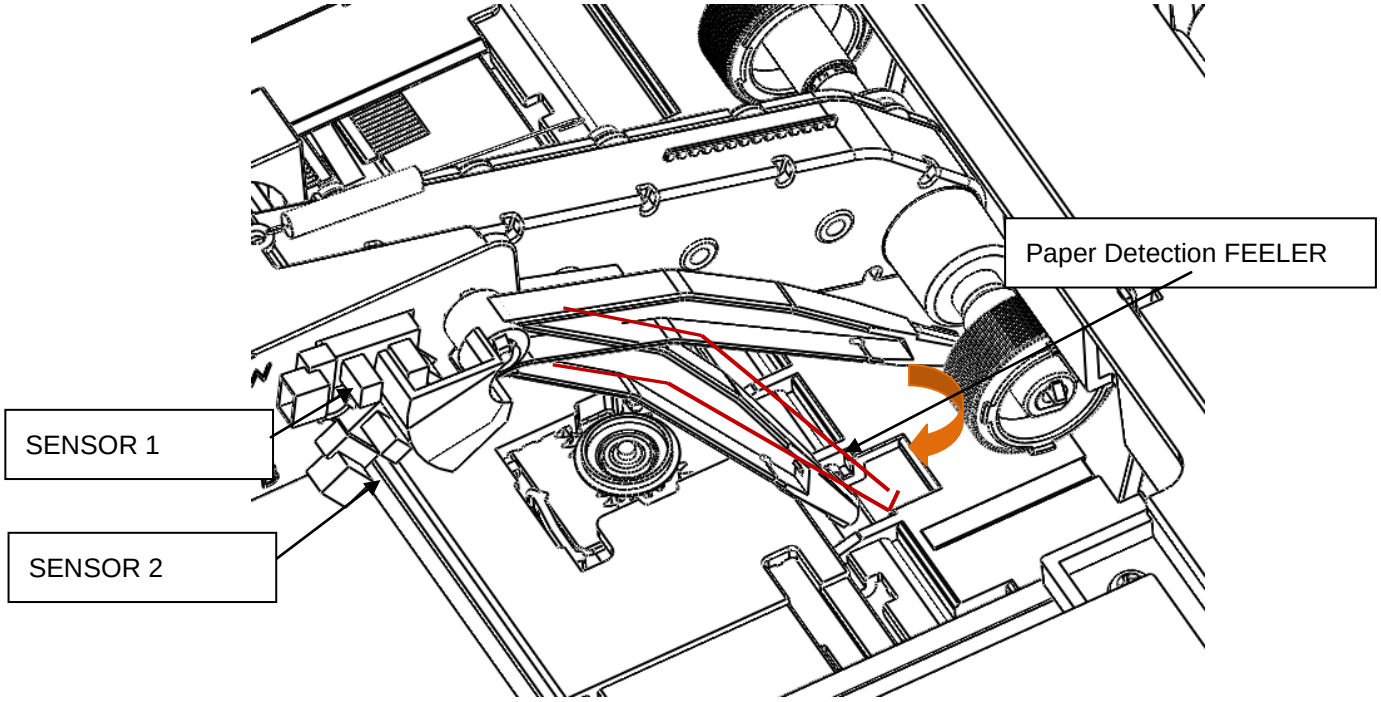


Hold right side fence lever and right side fence to move the side fence. Load paper up to the paper load limit on the side fence. Reusable paper can be categorized as Special Paper because of its curl.



Adjust the rear fence lever by holding and moving the fence. To load paper, hold the rear fence lever and push it back as far as possible, align the front part of paper to the separation dam, then hold the lever again and move it to fit the edge of the paper. Hold the rear fence in place.

Paper Detection



When the cassette tray becomes empty, the paper detection sensor flag drops to the slit in the base plate. The sensor flag blocks the path of the light from the transmitter to the receiver, altering the sensor output value. The printer detects whether there is paper in the tray by this change in the two sensors.

The two sensors detect 3 statuses: Paper Full. Paper Low and Empty, and display these messages on the LCD screen.

	Sensor 1	Sensor 2	Stack
Paper Full	●	○	10%-100%
Paper Low	○	○	Near End (under 10%)
Paper End	○	●	0 sheet , Paper End

● : Light Exposure ○ : Blocked

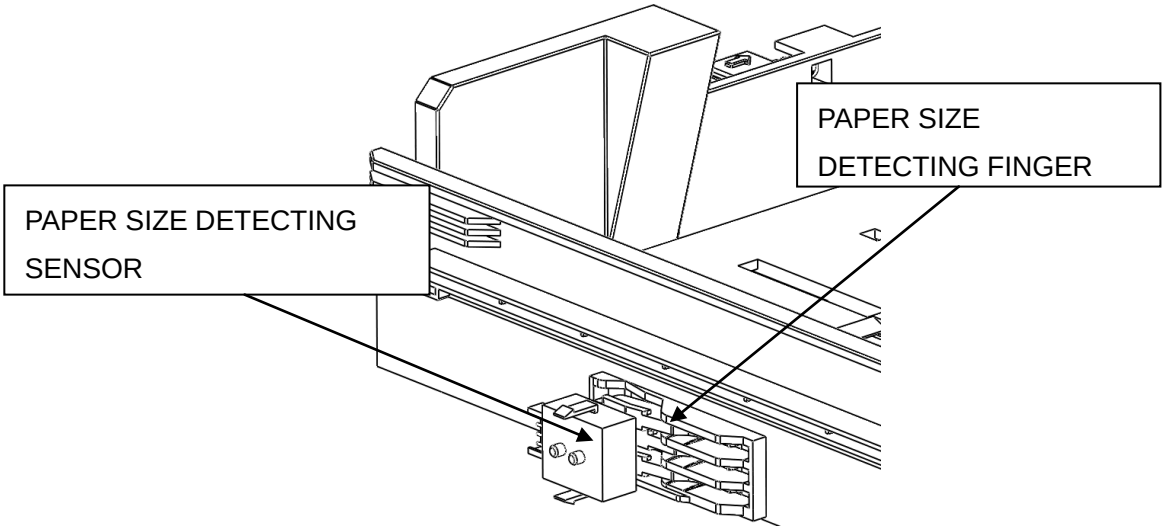
Paper Jam Detection

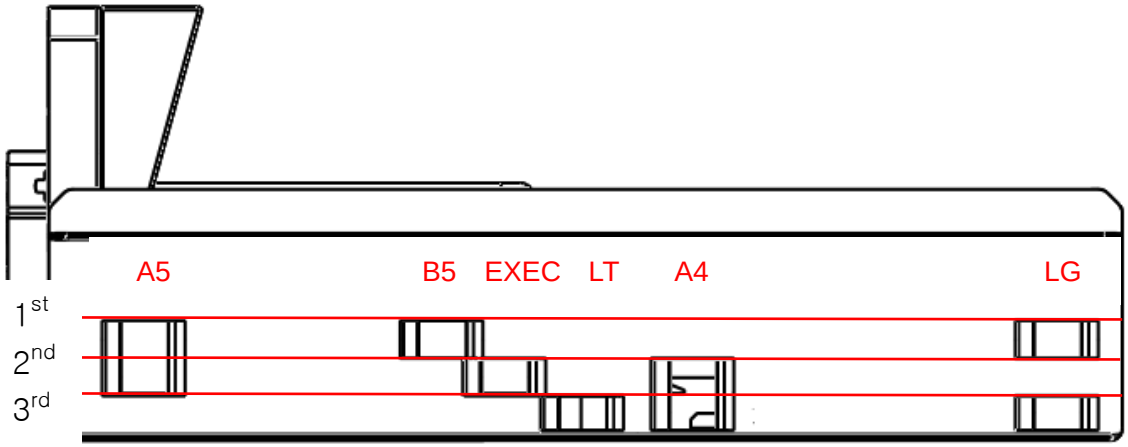
If the pickup roller fails to turn on the input sensor after having rotated once, it rotates one more time. If paper fails to turn on the input sensor even after the pickup roller has rotated twice, the printer determines that there is a paper jam (or miss-feed) and alerts the user.

Paper Size Detection

Adjust the end fence to fit the bottom edge of paper. The detection finger connected to the paper size detection sensor (Switch sensor, 3EA) enters the hole in the end fence for paper detection.

If the finger can enter the hole, the sensor detects “0”. If the finger cannot enter the hole, the sensor detects “1”.





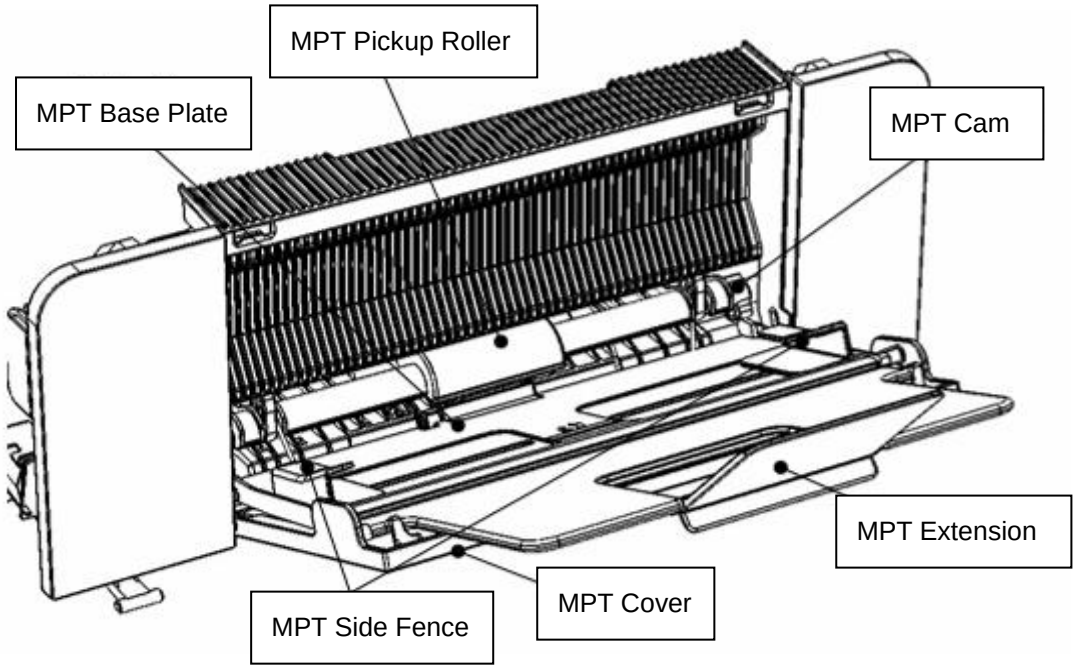
Switch	A5	B5	Exec	LT	A4	Legal
1st	0	0	1	1	1	0
2nd	0	1	0	1	0	1
3th	1	1	1	0	0	0

MPT (Multipurpose Tray)

Overview

This printer is equipped with a multipurpose tray (MPT) with a capacity of 50 A4 sheets (75gsm) as default.
MPT, like the main tray, uses friction pads to separate paper. A paper detection sensor is installed to detect paper status in the MPT. Because the MPT is not equipped with an automatic paper size detection sensor, this printer detects paper size by the on-off timing of the registration sensor.
When loading paper to MPT, expand the extension all the way and adjust side fences to the paper size to have no gaps.
Paper load limit lines are marked separately for postcards, envelops, labels and other special paper.

MPT Components

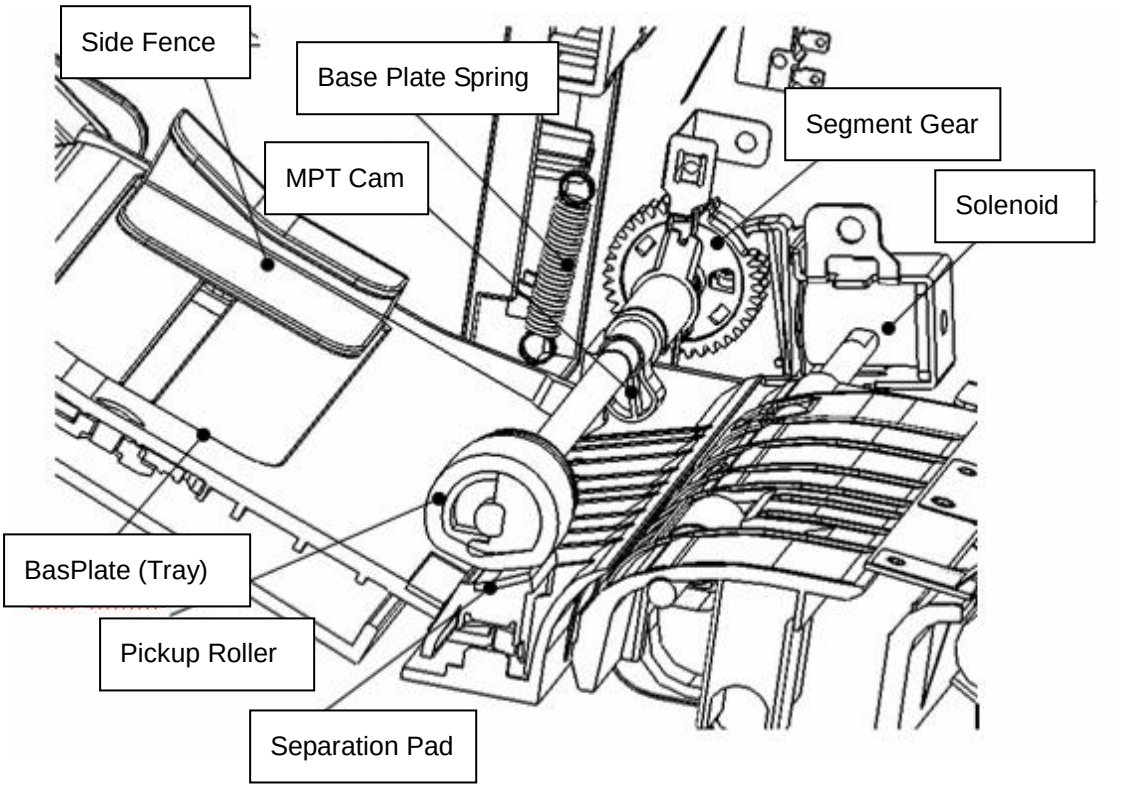


The MPT consists of the following 6 components. Role of each component is as follows.

1) MPT A’ssy: Consists of MPT cover, base plate and extension.
2) MPT Cam: Connected to MPT pickup roller and pickup roller
3) Lower body and Upper Guide: Acts as a guide for feeding paper
4) Solenoid and Segment Gear A’ssy: Delivers or isolates power to MPT pickup roller
5) Friction Pad: Prevents multiple paper feeding

6) Paper Load Detect Sensor: Detects paper in the tray

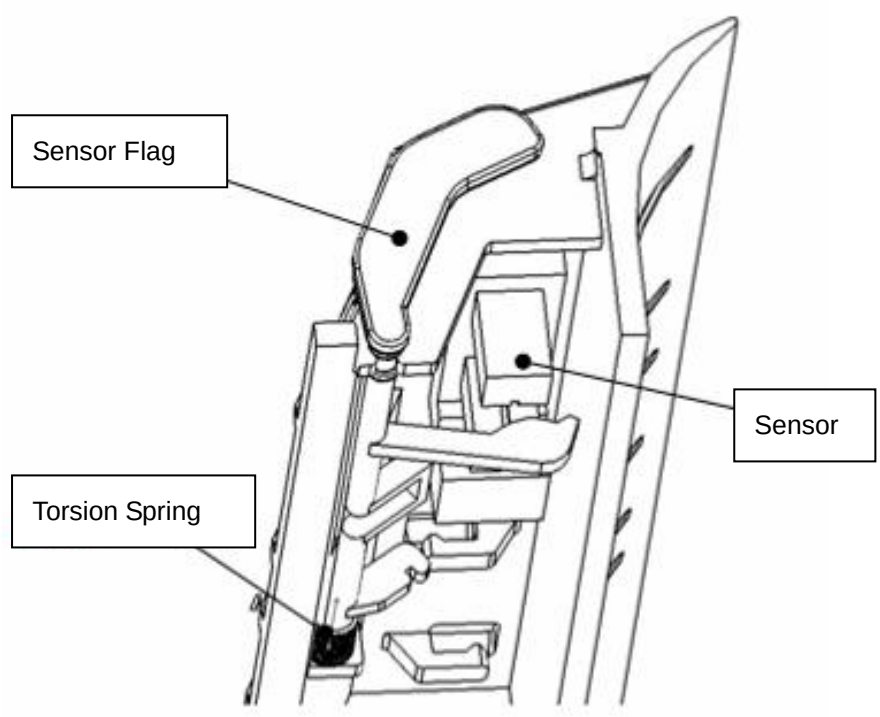
MPT Drive



MPT can load 50 sheets of plain paper, and when MPT is opened to load papers, the base plate goes down by cam and isolates with pickup roller for easy paper loading.
When loading papers, pull the extension out all the way and load papers less than 50 sheets on the tray and adjust side fences to not to have papers move around.
When feed signal is sent, solenoid gets operated to disable segment gear and delivers power from main motor to MPT's pickup roller. Therefore, when the cam that operates with MPT's pickup roller rotation rotates, the base plate rises by base plate spring to generate feeding force by contacting loaded paper with pickup roller and allows loaded paper to be fed in orders from top by pickup roller's rotation.
When the pickup roller rotates once, the segment gear works with solenoid to isolate power from main motor and the pickup roller stops its rotation to lower MPT base plate to initial position.
The friction pad isolation method is used for paper isolation method and papers get isolated one by one with friction pad's resistance force and friction pad spring's pressure.
Since paper presence detect sensor is installed, so, when all papers in the tray is used, MPT detects it and stops feeding operation.

As there is no paper size detect sensor, the user must assign the paper size from printer driver and if the paper size assigned from driver does not match with paper loaded in the tray, a paper jam will occur.

No Paper Detection in MPT



When papers are loaded on MPT, the sensor flag gets pressed and acknowledges paper presence and when all loaded papers are used, the paper presence detect sensor at the bottom body A'ssy returns to initial position by torsion sprint for sensor flag to isolate the light and causing the sensor's output value to change. The printer detects paper presence with this sensor's output value.

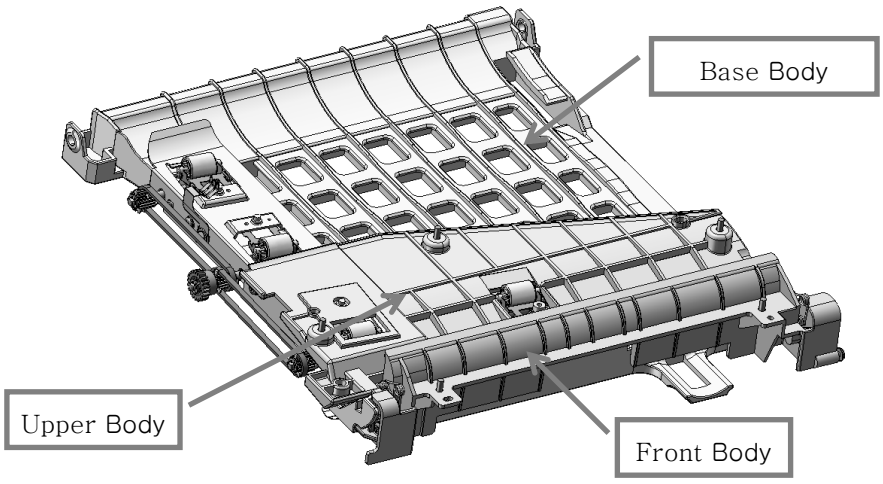
Paper Jam Detection

If the pickup roller of the MPT fails to turn on the input sensor by the top edge of the paper being fed after having rotated once, it rotates up to three more times. If paper fails to turn on the input sensor even after the pickup roller has rotated three times, the printer determines that there is a paper jam (or miss-feed).

This printer does not have an automatic paper size detection sensor. Paper size is detected

by the on-off timing of the registration sensor at feeding. Paper will be jammed also when the detected paper size does not match the size set on the PC.

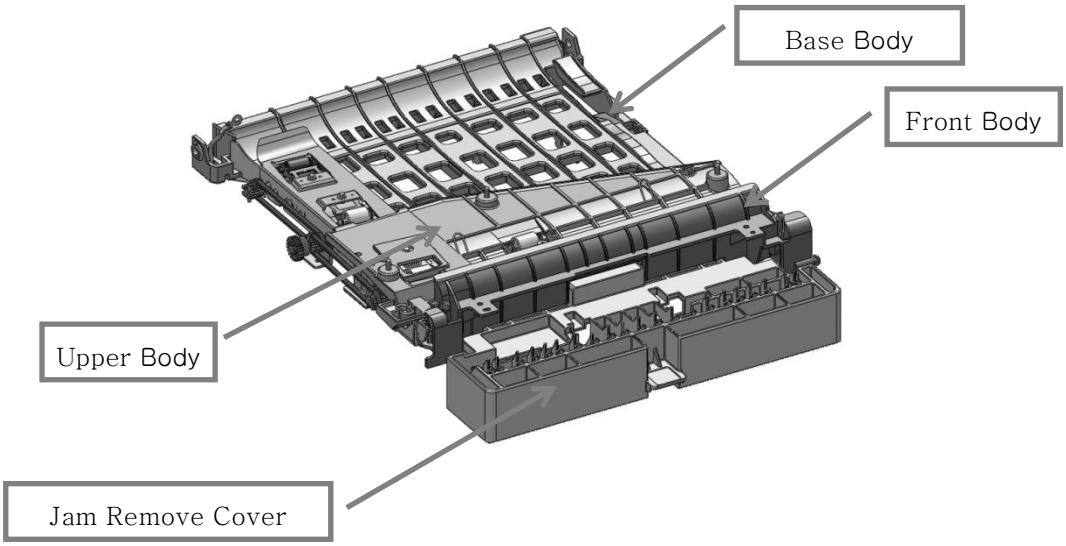
Duplex Unit Components (A610DN)



The duplex unit consists of the following 3 components. Role of each component is as follows.

1) Upper Body: Acts as upper ribs to allow paper to pass through easily. A roller is installed to partially correct skews.
2) Front Body: Guides paper in the reverse section (bottom) up to the EP frame (upper) and supports the base body with a spring fixture.
3) Base Body: Corrects skew to allow front part of the paper (A4/ Letter) being fed to be printed parallel by 3 rollers.

Duplex Unit Components (A611DN)

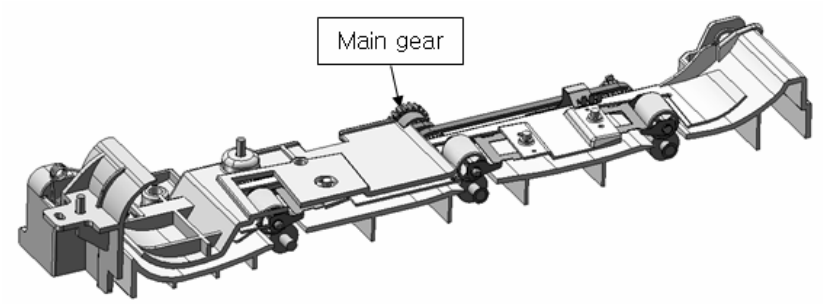


The duplex unit consists of the following 4 components. Role of each component is as follows.

1) Upper Body: Acts as upper ribs to allow paper to pass through easily. A roller is installed to partially correct skews.
2) Front Body: Guides paper in the reverse section (bottom) up to the EP frame (upper) and supports the base body with a spring fixture.
3) Base Body: Corrects skew to allow front part of the paper (A4/ Letter) being fed to be printed parallel by 3 rollers.

4) Jam Remove Cover: Opens paper path when there is a jam in the duplex to allow paper to be removed easily.

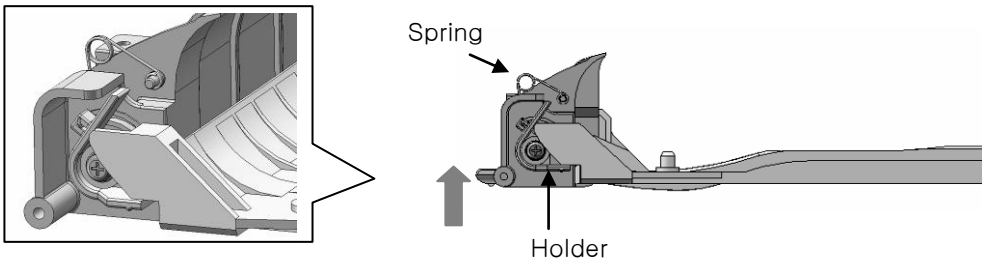
Duplex Unit Drive



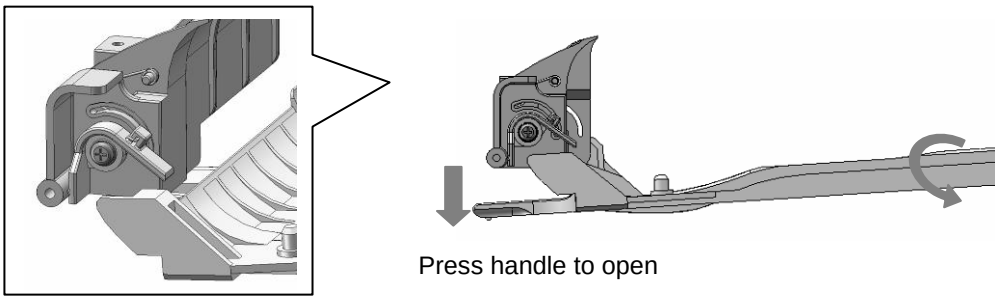
Duplex Unit is connected to the main operation and gears, and paper is fed to base body with reverse method of pick-a-boo method. The paper is re aligned to the left by a tilted roller in the reverse section. (Letter or A4)

Paper Jam Detection (A610DN)

When there is a paper jam in the reverse section of the duplex unit, remove the tray, then press the handle down to separate the base body for easy paper removal.



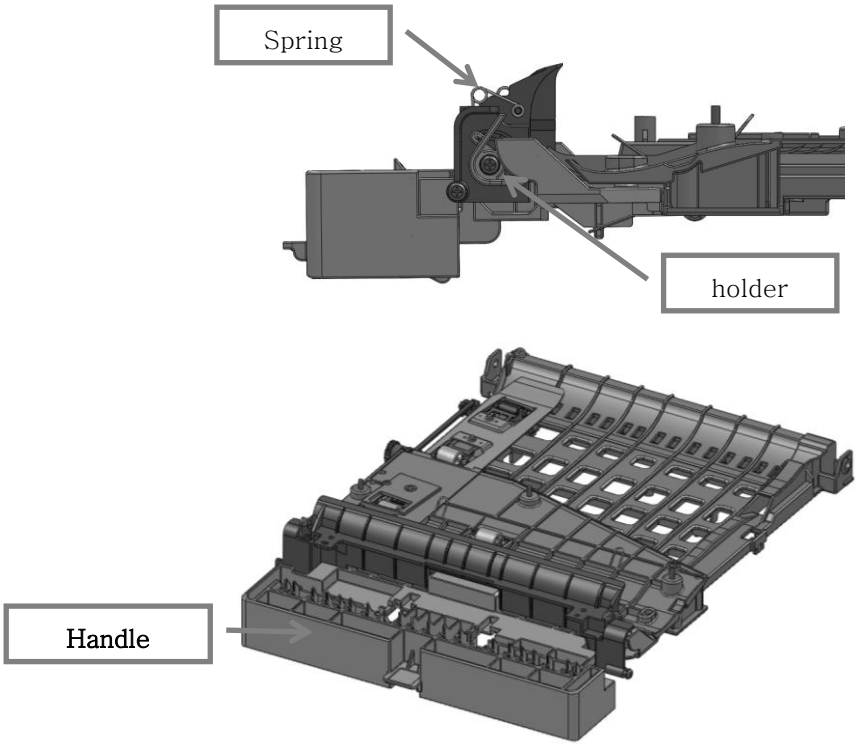
Lift handle to close



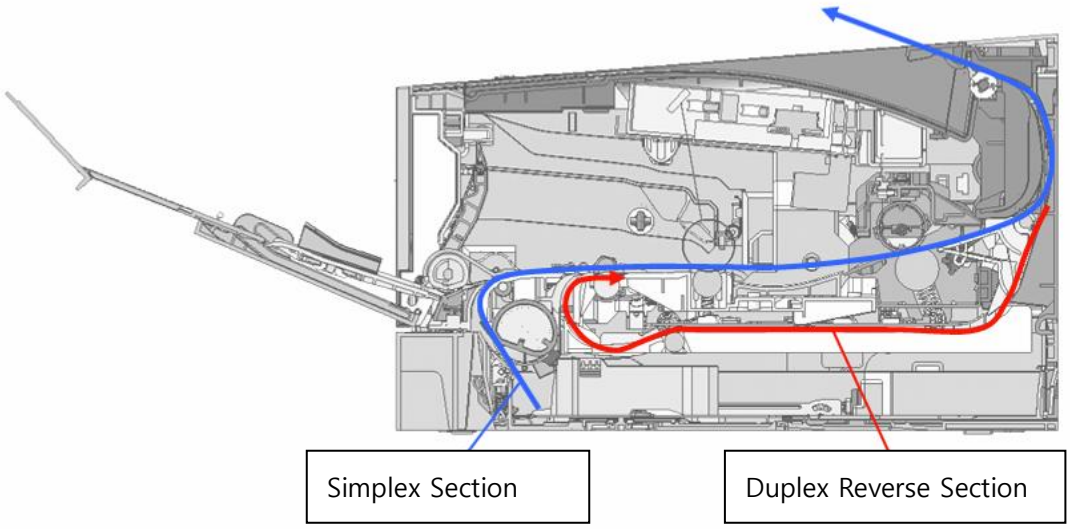
Press handle to open

Paper Jam Detection (A611DN)

When there is a paper jammed in the reverse section of the duplex unit, press down the handle on the jam remove cover (in the center) to remove paper with ease. If you cannot see the paper when the jam remove cover is open, open the rear cover and remove the jammed sheet of paper.



Duplex Unit Paper Path

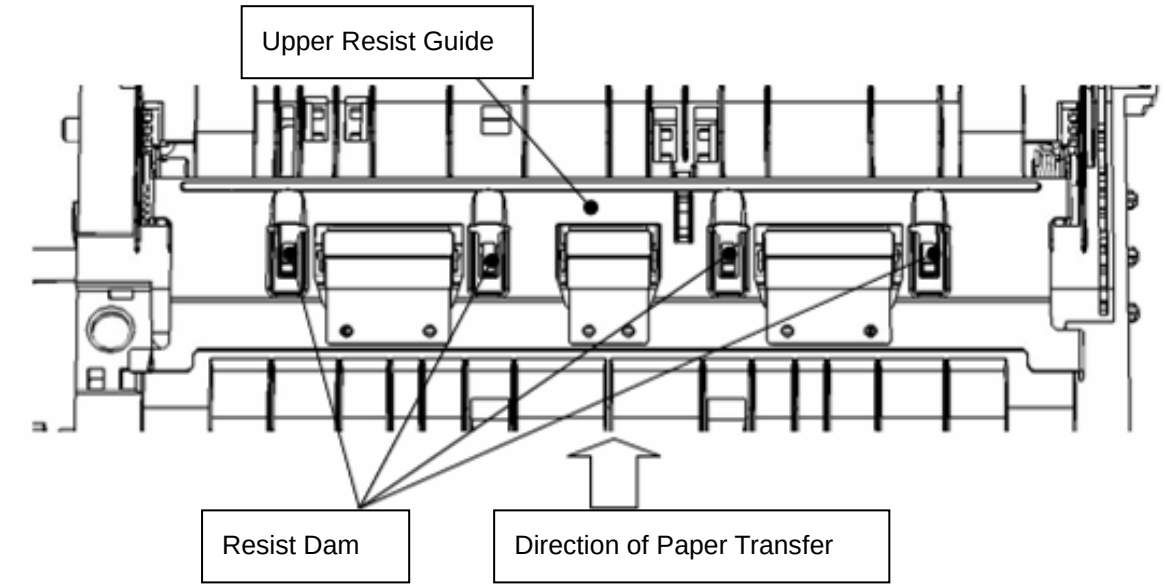


During 2-sided printing, paper proceeds first to the printer’s simplex section by the pickup roller and the front side is printed. Paper with the front side printed passes the fuser unit and reaches the output roller. The forward/backward bracket is activated by the solenoid operating in the output unit and the output roller rotates in reverse. Paper is then transferred to the duplex section.

Paper transferred to the duplex section then passes through the simplex section. Here, the other side of the paper is printed and finally dispensed onto the output bin by the output roller.

Resist Unit

The resist unit prevents skew in the front part of paper when image is printed by aligning the front part of the paper being fed from the tray.



Resist Unit Components

The resist unit consists of the following three components.

1) Resist driver roller
2) Upper resist guide and pressure backup roller
3) Resist dam and spring for paper alignment

Resist Unit Drive

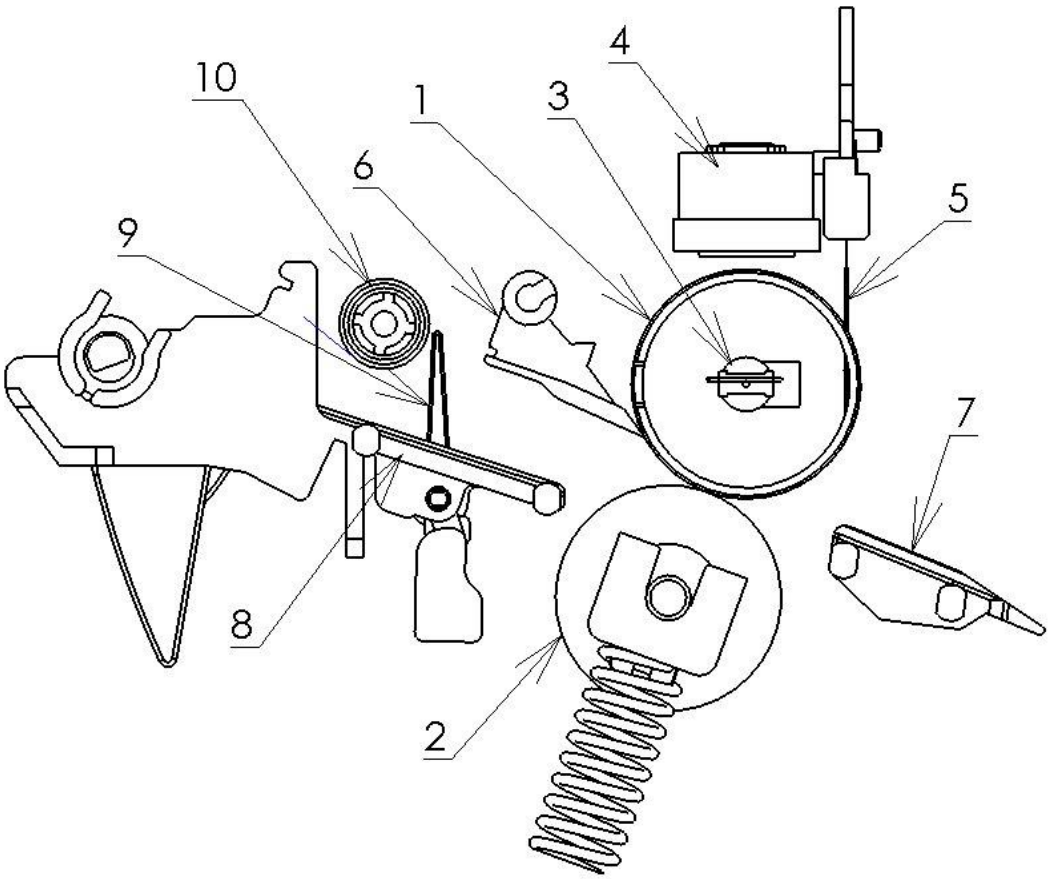
When paper is fed from the main tray or the MPT, the paper enters the resist unit along the guide. The paper then is delayed temporarily by the resist dams (4). Feeding has been delayed by the resist dams but the paper continues to be transferred by pickup roller rotation. This and the delay by the dams causes the front part of the paper to curl slightly, and during this process the front of the paper is aligned in parallel.

The paper with a curl at the front pushes the resist dam when pressure is continuously applied, and the front part of the paper is clamped between the resist drive roller and the backup roller the moment the dam is unlocked by this force, and paper is transferred into the printer.

Image Fusing

Overview

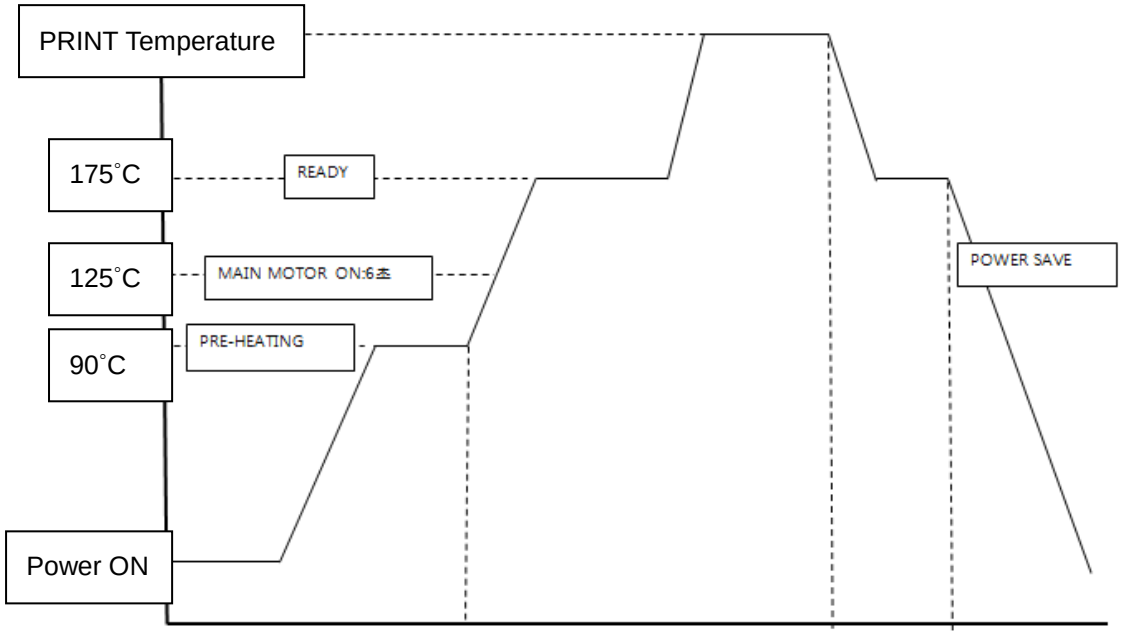
Fuser Unit Components



The fuser unit and paper exit area consist of the following parts.

1. Fusing Roller
2. Pressure Roller
3. Heater
4. THERMOSTAT
5. THERMISTOR
6. Separator
7. Entrance Guide
8. Exit Guide
9. Exit Sensor
10. IDLE Roller

Fusing Temperature Control



The fuser heater is turned ON immediately after the main power is switched on.

If there is no output signal when the main motor operates at 125 ˚C, READY status is maintained at 175 ˚C.

If there is an output signal, fusing temperature is maintained at 180 ˚C for fusing paper. (180 ˚C is the default value for standard paper)

Different fusing temperature is set for each paper type.

Fusing temperature is configured differently for each paper, but may be changed within a certain range by the user.

Heater power is turned OFF when an error occurs or when printer enters Power Save mode.

Overheat Prevention

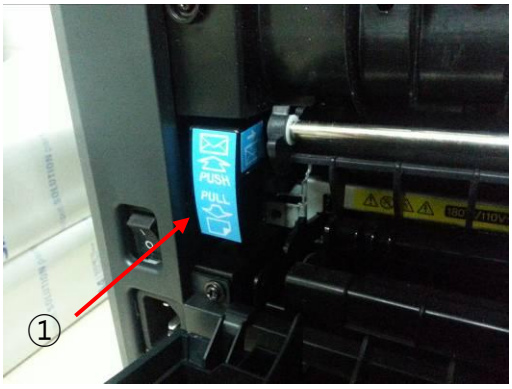
When Fusing Roller's temperature rises higher than 230˚C, CPU cuts off fusing lamp power and generates ERORR message at the same time.

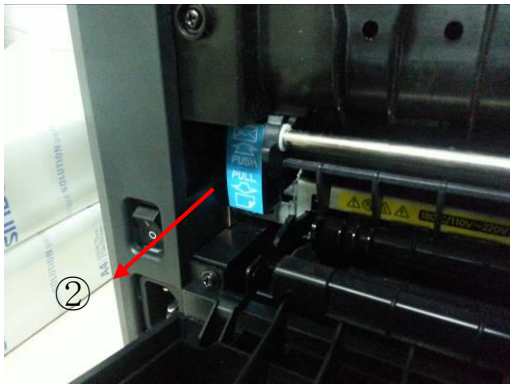
To prepare for when the thermistor fails to prevent overheating, 2 thermostats have been added next to the general grounding cable of the fusing lamp. A thermostat cuts off power

transferred to the fusing lamp when the fuser is overheated, and generates the error at the same time to stop the printer.

Pressure Lifting (for Envelops)

When you open the back cover and push the pressure lifting lever in the direction of no. 1, the distance between the pressure roller and fusing roller is expanded by the cam. If you pull in the direction of no.2, the distance will be restored.





⚠WARNING

Printing with pressure lifted may cause contamination in the fusing roller and the pressure roller and toner may be smeared on paper. Be sure to restore the pressure lifting lever after printing envelops.

Output Unit

Overview

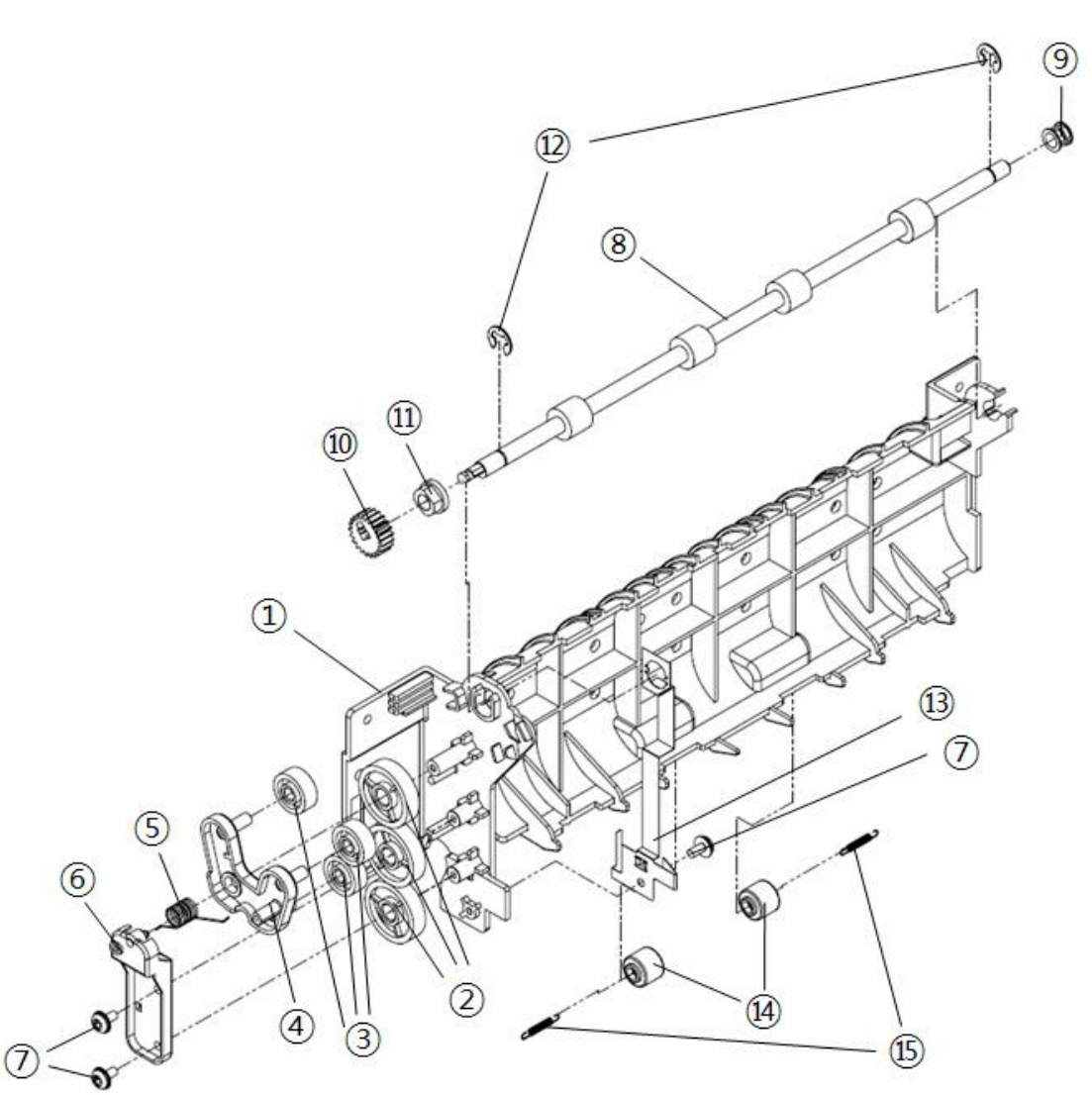
The output unit is the last part of the printer that moves paper to the output bin. It is the part that allows paper to pass though the fuser unit to be stacked onto the top output bin. In models with a duplex, the output unit reverses the rotating direction in order to operate the duplex unit.

To prevent paper jams caused by an overflowing stack, the Paper Full detection sensor allows “Paper Full” to be displayed when certain amount of paper has been stacked (250 sheets of standard paper in standard environment). If jammed paper is behind the fuser unit, open the output cover and remove the paper.

Output Unit Components

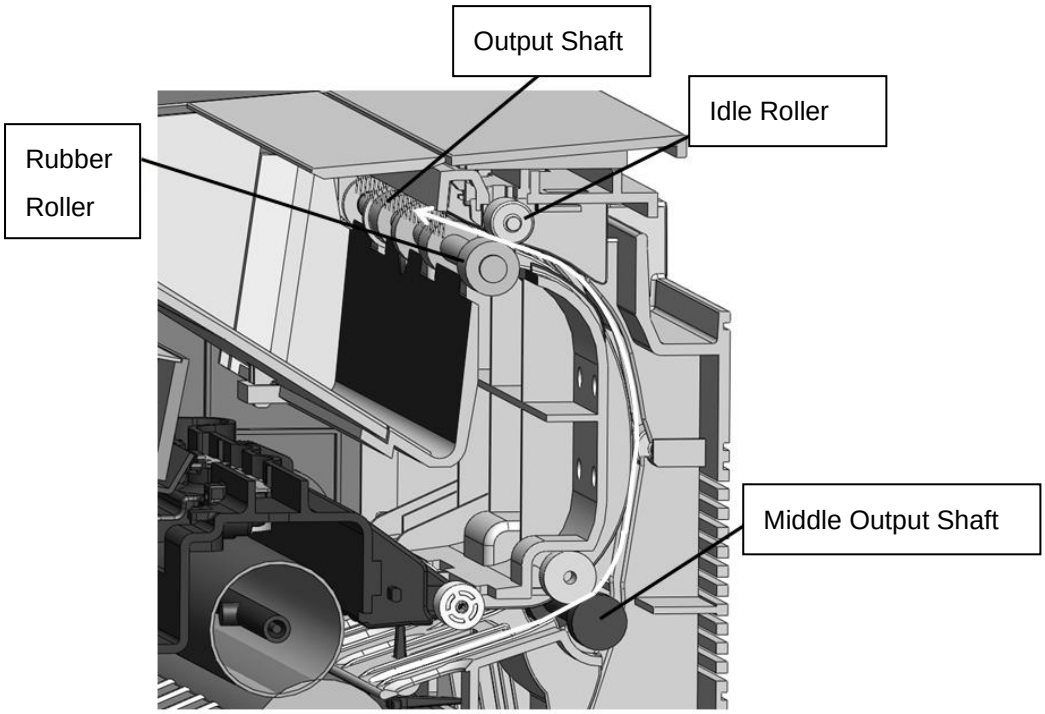
The output unit consists of the following 15 components. Role of each component is as follows.

1) Output Frame: Other parts of the output unit are assembled and act as a guide for the print side of paper
2) Large Output Gear: Delivers power from the fusing gear to no.3 small gear.
3) Small Output Gear: Delivers last rotating power to the output shaft.
4) Forward/Reverse Bracket: Controls output shaft rotation by moving to solenoid
5) Bracket Spring: Positions no.4 bracket to allow the output shaft to rotate forward when solenoid is not operating.
6) Gear Bracket: Fixes positions of large and small output gears and the forward/reverse bracket
7) Screw
8) Output Shaft: 4 rollers inserted in sum shaft (assembled) that are connected to the gear and rotate with the idle roller assembled in the upper cover to give paper locomotive power
9) Busing: Reduces friction in the rotation unit of the output shaft
10) Shaft Gear: Delivers rotating power from the small output gear to the output shaft
11) Sintered Bushing: Connects the earth plate to the output shaft to remove static electricity from the conductive output shaft.
12) E Ring: Holds the output shaft to prevent it from shaking sideways
13) Earth plate: Removes the static electricity in the output shaft to the ground.
14) Output Frame Idle Roller: Transfers short paper
15) Idle Output Spring: Applies pressure to the idle roller in the output frame



Output Unit Drive

Paper that has passed through the fuser is transferred along the paper path. The front part of the paper fed from the fuser is transferred through the middle output shaft to the output shaft. The end of the paper that has reached the output shaft passes through the fusing roller and the middle output roller by the rotating output shaft before finally reaching the exit. Each shaft always rotates when the main motor operates in order to give paper locomotive power. The middle output shaft and the output shaft are equipped with 2 and 4 rubber rollers respectively (assembled), and these rubber rollers are paired with idle rollers. Each idle roller applies pressure to a rubber roller with a spring to give friction force.

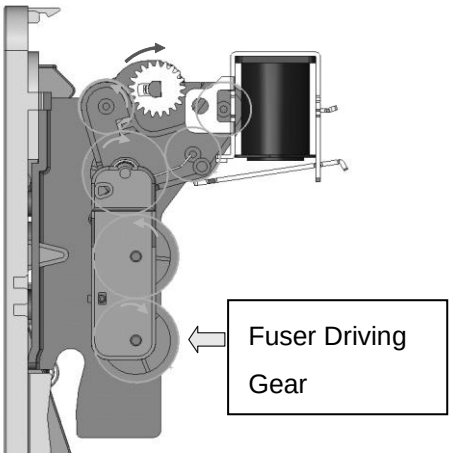


Forward & Reverse Output (Duplex Unit Drive)

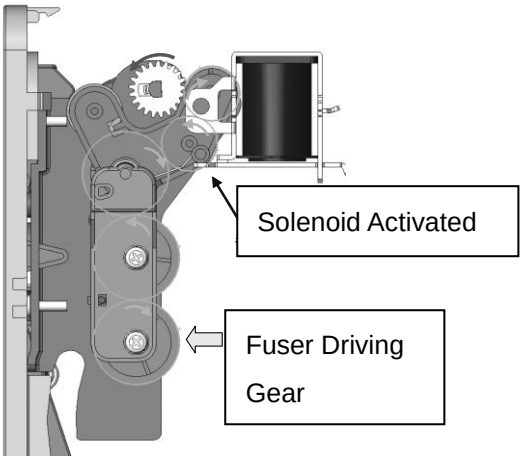
The main driving motor in the main body always rotates forward. The rotation force of main driving motor is delivered to the output shaft through the fuser driving gear in the output unit and rotates the output shaft. Because the fuser drive unit always rotates forward, the forward/reverse bracket is operated by solenoid operation in order to print 2 sides by reversing delivery unit.

The left image below shows that solenoid is turned off when rotating forward and 4 gears are connected to rotate the output shaft forward.

The right image shows that solenoid is turned on and 5 gears are connected to the fuser driving gear to reverse the rotating direction.



Forward Rotation

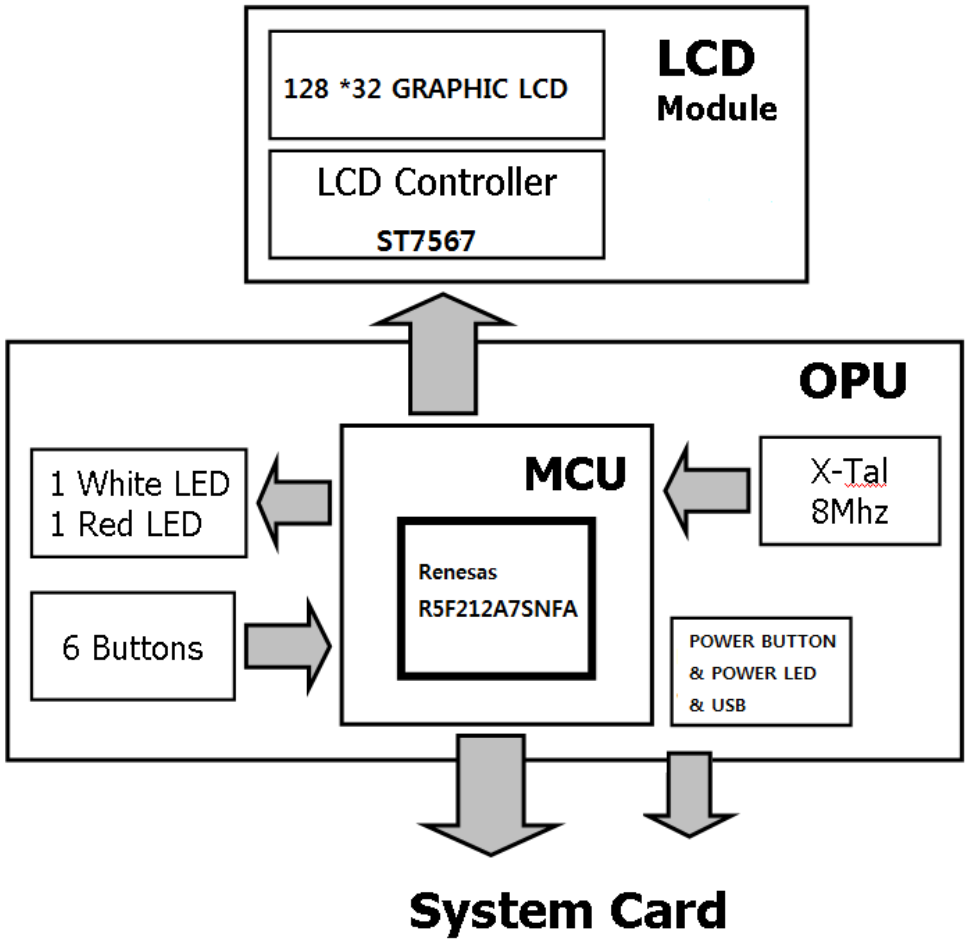


Reverse Rotation

Front Part Overview

Operational Panel Unit (OPU) Components and Main Functions (A610DN)

Block Diagram of Components



Pin Array

I/F Connector		
PIN No.	Signal	Description
1.	VCC5V	5V POWER
2.	GND	GND
3.	UICC_IRQ	INTERRUPT

4.	SSI	SPI TX DATA
5.	SSO	SPI RX DATA
6.	GND	GND
7.	SSCK	SPI CLOCK
8	SCS	SPI SELECTING SIGNAL
9	POWER_BUTTON	POWER BUTTON SIGNAL
10	+5V_LED	POWER BUTTON LED POWER
11	POWER_LED	POWER BUTTON LED SIGNAL

USB Connector		
PIN No.	Signal	Description
1.	VBUS	USB POWER
2.	D-	USB D- DATA
3.	D+	USB D+ DATA
4.	GND	GND
5.	SHIELD1	USB SHIELD GND
6.	SHIELD2	USB SHIELD GND

Components and Basic Functions

Basic components of OPU and their functions are as follows.

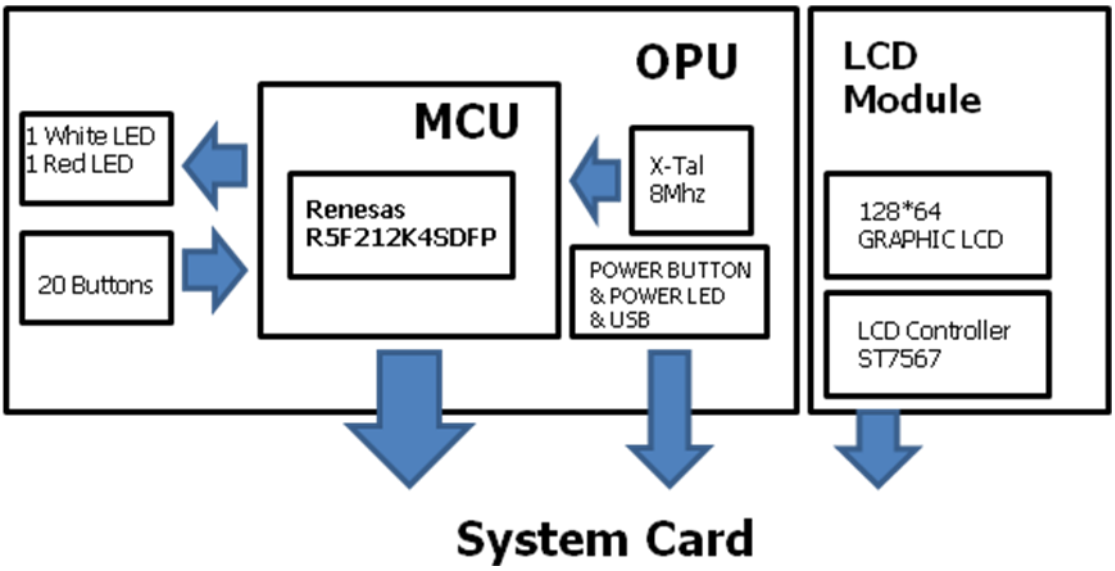
1. R5F212A7SNFA of MCU uses 8 Mhz external clock to communicate with system card by SPI. Communication standard is 32KHz SPI.
2. OP consists of 7 keys. BUTTON1~6 Lines are each connected to an MCU GPIO PORT to detect which button is pressed. The power button is connected to the Power Management IC in the system card.
3. White LED and red LED are controlled separately by using LED S8050 (NPN TR) as a switching element..
4. The MCU on OPU and LCD controller on LCM (LCD module) transmit and receive signals with 4-bit parallel method.

5. LCD's backlight uses S8050 (NPN TR) as a switching element to control on and off.

Operational Panel Unit(OPU) Components and Main Functions (A611/A616DN)

Operational Panel Unit(OPU) Components and Main Functions (A611DN)

Block Diagram of Components



Pin Array

I/F Connector(CN2)		
PIN No.	Signal	Description
1.	VCC5V	5V POWER
2.	UICC_TXD	UART TX: Signal for sending data to SYSTEMCARD
3.	UICC_RXD	UART RX: Signal for receiving data from SYSTEMCARD
4.	GND	GND
5.	GND	GND
6.	POWER_BUTTON	UI POWER BUTTON SIGNAL
7.	GND	GND
8	POWER_LED	POWER LED 5V POWER

9	POWER_LED_GND	POWER LED GND

LCD CONTROL Connector(CN1)		
PIN No.	Signal	Description
1.	CSB	Chip select signal to LCD
2.	RSTB	Reset signal to LCD
3.	A0	Distinguishing signals for command or data sent to LCD
4.	CLK	Clock signal to LCD
5.	RXD	Data signal to LCD
6.	LCD_BACKLIGHT	LCD_Backlight ON signal

USB Connector(J1)		
PIN No.	Signal	Description
1.	VBUS	USB POWER
2.	D-	USB D- DATA
3.	D+	USB D+ DATA
4.	GND	GND
5.	SHIELD1	USB SHIELD GND
6.	SHIELD2	USB SHIELD GND

Components and Basic Functions

OPU's basic components and their functions are as follows.

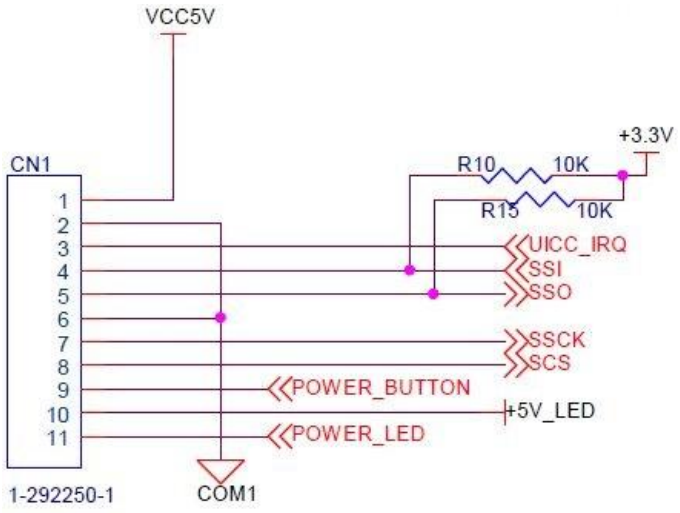
1. R5F212K4SDFP in MCU uses 8Mhz external clock to communicate with the system card via UART. Communication standard is 9600bps UART.
2. OP consists of 21 keys. Buttons 1~20 are connected to the MCU GPIO PORT via Matrix so that they detect which button is pressed. The power button is connected to the Power Management IC in the system card.

3. White LED and red LED are controlled separately by using LED S8050 (NPN TR) as a switching element..
4. SOC in the system card and the LCD controller in LCM (LCD module) exchange signals via 4-bit parallel method.
5. LCD's backlight uses S8050 (NPN TR) as a switching element to control on and off.

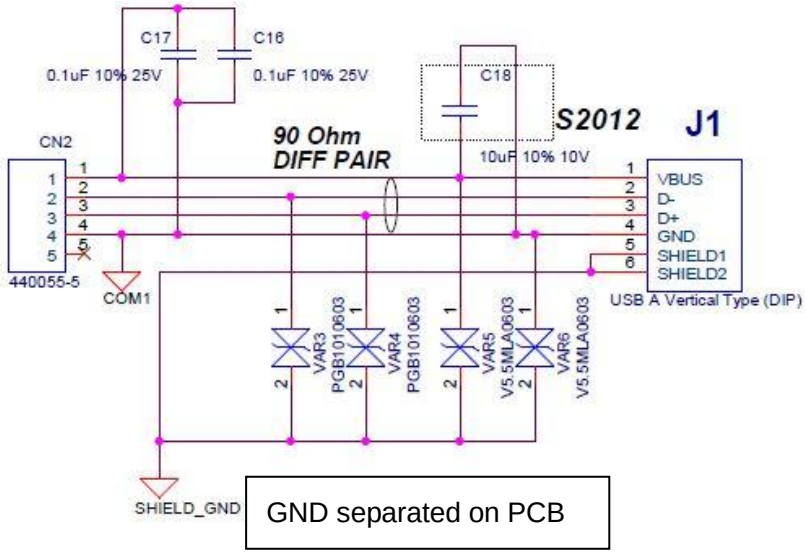
Circuit Diagram

1. Connector Part

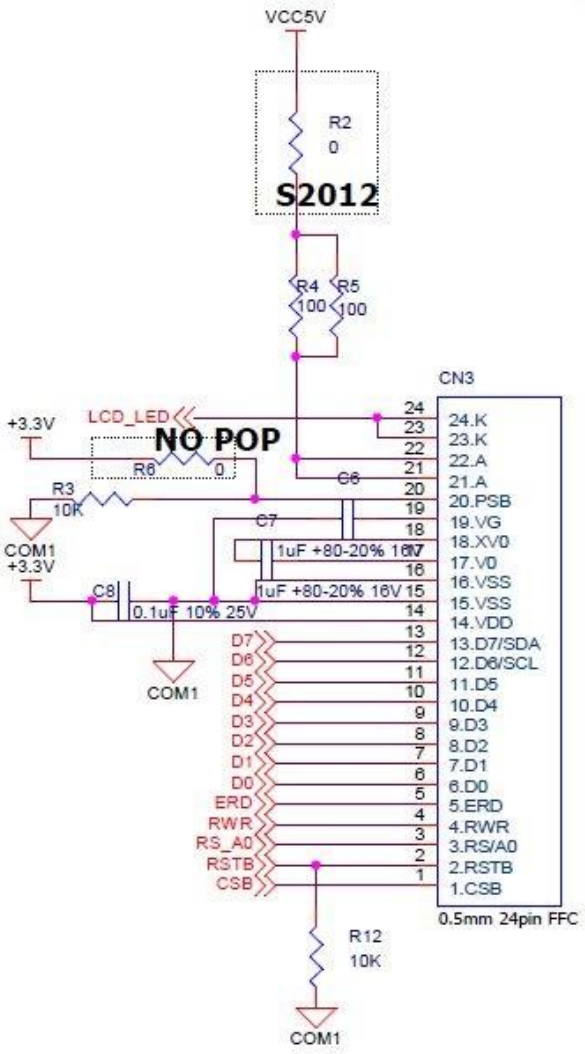
I/F Connector



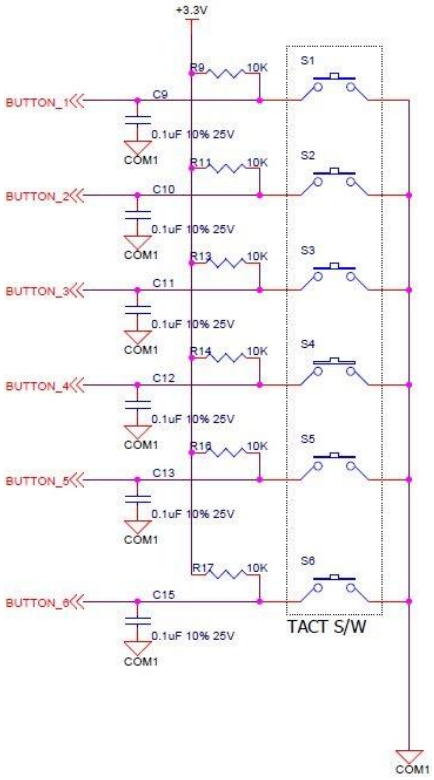
USB Connector



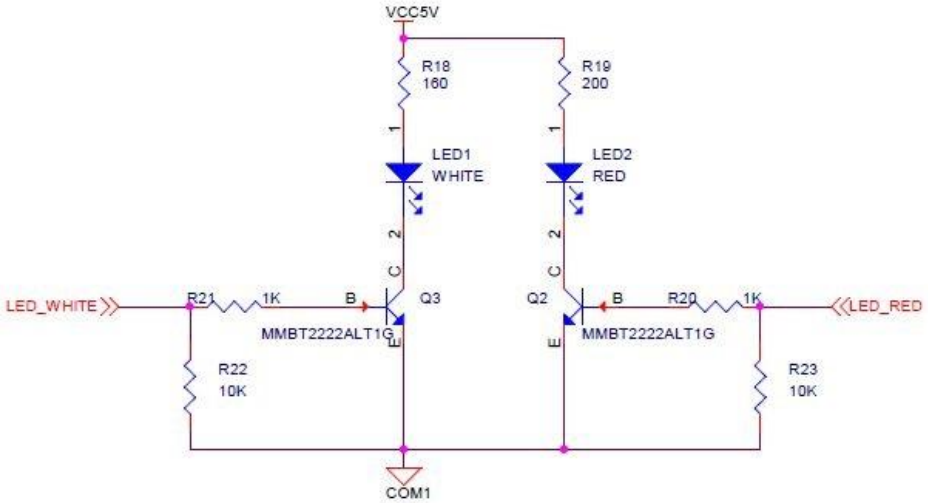
2. LCM Connection Part



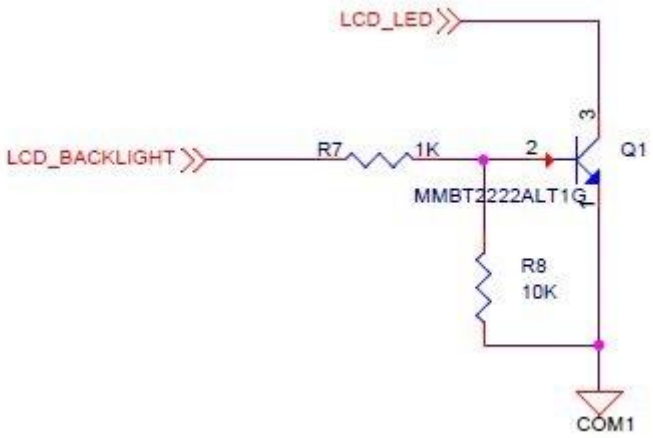
3. Button Input



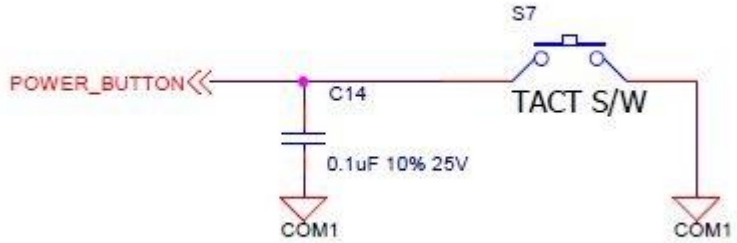
4. LED Drive

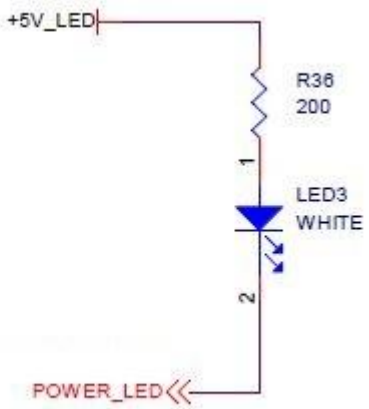


5. Backlight Control



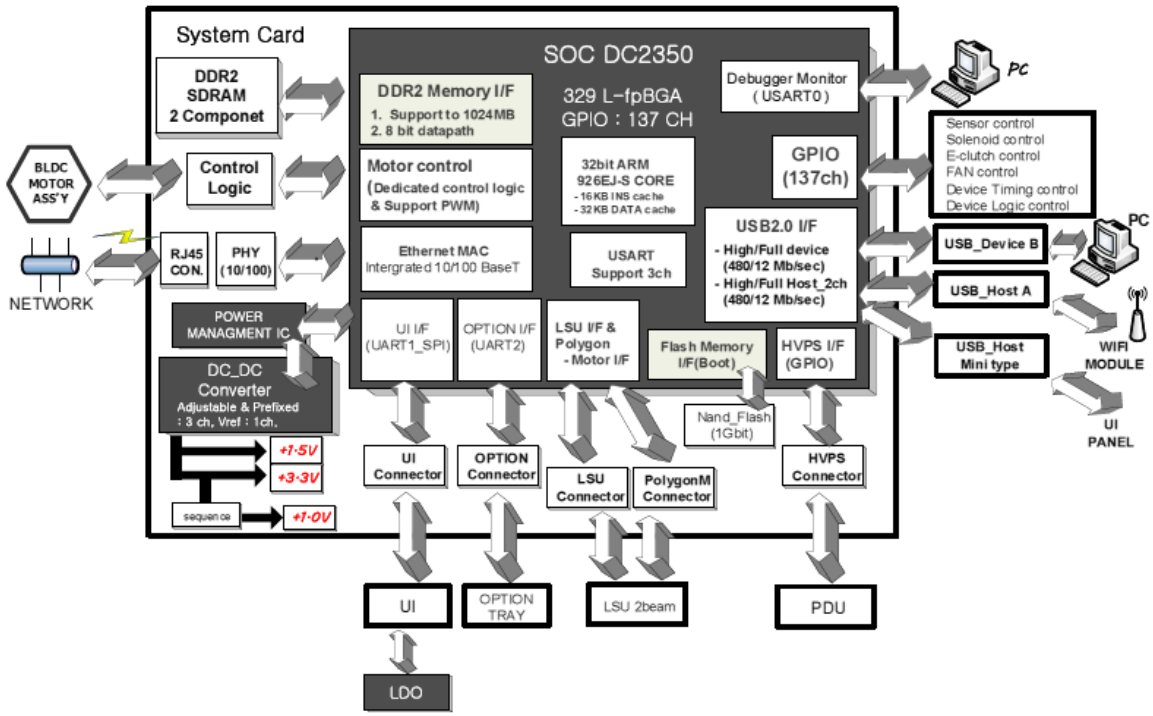
6. POWER BUTTON & POWER LED





System Card Components and Main Functions (A610DN)

Block Diagram of Components



Components and Basic Functions

The system card consists of components shown above and their main functions are as follows.

■ Main Functions of SOC (DC2350)

- Controls entire program flow by reading execution codes from flash memory (serial and NAND flash)
- System Main Clock uses 24MHz (external) and 360MHz (internal)
- SOC with each function module built-in performs following functions.
  - Motor Control: It controls BLDC motor to control the controller.
  - UICC (Control Panel) I/F: The built-in URAT I/F is used as to control the controller.
  - Optional Tray I/F: Controls optional tray using the built-in UART I/F module
  - USB I/F controller is built-in to send and receive data with PC and connect to Wi-Fi or memory stick.
  - LSU and components are controlled by GP I/O.

Pin Array

1. CN1 (PC Debugger)

NO.	Signal	Description
1	TXD0	UART TX: Data signal to PC
2	RXD0	UART RX: Data signal from PC
3	+3.3V	3.3V Power
4	GND	GND

2. CN2 (Smart IC)

NO.	Signal	Description
1	+3.3V	3.3V Power
2	I2C_DAT	Data sharing with SMART IC
3	I2C_CLK	DATA sharing clock
4	GND	GND

3. CN41 (BLDC_M)

NO.	Signal	Description
1	S.GND	SIGNAL GND
2	BLDC_FG	F/B signal for checking motor rotation standard
3	BLDC_CLK	Standard clock for motor
4	BLDC_ST	Motor ON signal
5	BLDC_LD	Detects arrival of set RPM
6	P.GND	POWER GND
7	+24V	24V Power
8	+3.3V	3.3V Power
9	Direction	Sets rotating direction

4. CN54 (OPTION TRAY_IF)

NO.	Signal	Description
1	OPTION_TXD2	UART TX: Data signal to OPTION
2	GND	GND
3	OPTION_RXD2	UART RX: Data signal from: OPTION
4	GND	GND
5	GND	GND
6	GND	GND

7	+24V	24V Power
8	GND	GND
9	+5V	5V Power

5. CN8 (P_MOTOR)

NO.	Signal	Description
1	nLSU_CLK_H	Standard Clock to polygon motor
2	nREADY_H	Ready signal from polygon motor
3	nSTART_H	Polygon motor ON signal
4	GND	GND
5	+24V	24V Power

6. CN48 (LSU_IF)

NO.	Signal	Description
1	GND	GND
2	nHSYNC_H	Sync detection signal
3	GND	GND
4	+5V	5V Power
5	+5V	5V Power
6	GND	GND
7	DT1P	Image LVDS Data
8	DT1N	Image LVDS Data
9	GND	GND
10	DT2P	Image LVDS Data
11	DT2N	Image LVDS Data
12	GND	GND
13	nSH_K1	SAMPLING&HOLD
14	nSH_K2	SAMPLING&HOLD
15	nENB	LD ENABLE Signal
16	NC	NC
17	NC	NC
18	GND	GND

7. CN51 (Power_IF)

NO.	Signal	Description

1	TX_SENSING	Transcription F/B Signal
2	TX_ENB	Transcription ENABLE
3	TX_PWM	Transcription Printing
4	CHGPWM	Changed Printing
5	DEVPWM	Developed Printing
6	+24V	24V Power
7	+24V	24V Power
8	+24V	24V Power
9	GND	GND
10	GND	GND
11	+5V	5V Power
12	GND	GND
13	HR_PSU	Fusing Heater ON signal
14	XZEROX	Zero Cross Signal
15	PS_24V	24V Power Save Signal

8. CN25 (MAIN FAN)

NO.	Signal	Description
1	MAIN_FAN	FAN ON Signal
2	MAIN_FAN_BACK	Detects arrival of set RPM
3	GND	GND

9. CN49 (SUB FAN)

NO.	Signal	Description
1	SUB_FAN	SUB FAN ON Signal
2	SUB_FAN_BACK	Detects arrival of set RPM
3	GND	GND

10. CN27 (MPT SOL)

NO.	Signal	Description
1	+24V	24V Power
2	MPT_SOL_L	MPT Feeding Solenoid ON

11. CN26 (EXIT SOL)

NO.	Signal	Description

1	+24V	24V Power
2	EXIT_SOL_L	Output Solenoid ON

12. CN28 (TRAY_E-Clutch)

NO.	Signal	Description
1	+24V	24V Power
2	E-Clutch_L	Feeding E-clutch ON

13.CN58 (OP_IF)

NO.	Signal	Description
1	+5V	5V Power
2	GND	GND
3	UI_IRQ	UI Communication Signal
4	UI_RXD1	UART RX: Data signal from UI
5	UI_TXD1	UART TX: Data signal to UI
6	GND	GND
7	UI_SCK	UI Communication control clock signal
8	UI_CS	UI Select signal
9	POWER BUTTON	UI POWER BUTTON Signal
10	+5V	5V Power
11	POWER BUTTON _LED	UI POWER BUTTON LED Signal

14. CN42 (Micro Switch)

NO.	Signal	Description
1	+24V	24V Power
2	+24V_SW	24V Power via switch

15. CN36 (Input_S)

NO.	Signal	Description
1	INPUT_S	Paper input detection
2	GND	GND
3	+5V	5V Power

16. CN24 (EMPTY_MPT_S)

NO.	Signal	Description

1	EMPTY_S	Detects paper in tray
2	GND	GND
3	+5V	5V Power
4	MPT_S	Detects paper in MPT
5	GND	GND
6	+5V	5V Power

. 17. CN45 (FULL STACK_S)

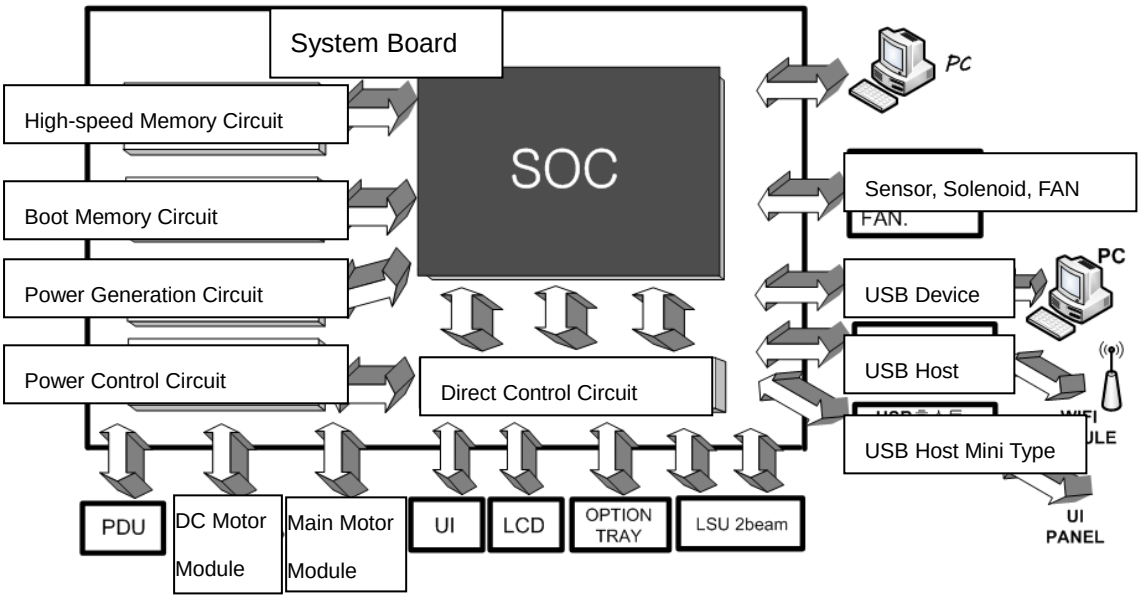
NO.	Signal	Description
1	FULL STACK_S	Detects full paper stack
2	GND	GND
3	+5V	5V Power

18. CN13 (Fuser Exit_S)

NO.	Signal	Description
1	THERMISTER	Detects fuser temperature
2	GND	GND
3	FUSER_S	Detects paper output
4	GND	GND
5	+5V	5V Power

System Card Components and Main Functions (A611DN)

Block Diagram of Components



Components and Basic Functions

The system card consists of the components shown above and their main functions are as follows.

■ Main Functions of SOC (88PA6170)

- Reads execution code from flash memory to control flow of entire program
- System Main Clock uses 25MHz (internal) and 800MHz (external)
- SOC with functions modules built-in carries out the following functions.
  - Motor Control: Controls BLDC motor to control the drive unit.
  - UICC (Control unit) I/F: Uses the built-in UART I/F module to control the control unit.
  - Optional Tray I/F: Uses the built-in UART I/F module to control the optional tray
  - USB I/F controller is built in to send and receive data with PC and connects to Wi-Fi using HOST port.
  - LSU and parts are controlled using GP I/O.

Pin Array

1. CN1 (PC Debugger)

NO.	Signal	Description
1	TXD0	UART TX: Data signal to PC
2	RXD0	UART RX: Data signal from: PC
3	+3.3V	3.3V Power
4	GND	GND

2. CN2 (Smart IC)

NO.	Signal	Description
1	+3.3V	3.3V Power
2	I2C_DAT	Share data with SMART IC
3	I2C_CLK	Standard clock for data sharing
4	GND	GND

3. CN41 (BLDC_M)

NO.	Signal	Description
1	S.GND	SIGNAL GND
2	BLDC_FG	F.B signal for checking motor rotation standard
3	BLDC_CLK	Standard clock for motor
4	BLDC_ST	Motor ON signal
5	BLDC_LD	Detects arrival of set RPM
6	P.GND	POWER GND
7	+24V	24V Power
8	+3.3V	3.3V Power
9	Direction	Set rotating direction

4. CN73 (OPTION TRAY_IF)

NO.	Signal	Description
1	OPTION_TXD2	UART TX: Data signal to option
2	GND	GND
3	OPTION_RXD2	UART RX: Data signal from option
4	GND	GND
5	GND	GND
6	GND	GND

7	+24V	24V Power
8	GND	GND
9	+5V	5V Power

5. CN8 (P_MOTOR)

NO.	Signal	Description
1	nLSU_CLK_H	Standard clock to polygon motor
2	nREADY_H	READY signal from polygon motor
3	nSTART_H	Polygon motor ON signal
4	GND	GND
5	+24V	24V Power

6. CN48 (LSU_IF)

NO.	Signal	Description
1	GND	GND
2	nHSYNC_H	Sync detection signal
3	GND	GND
4	+5V	5V Power
5	+5V	5V Power
6	GND	GND
7	DT1P	Image LVDS data
8	DT1N	Image LVDS data
9	GND	GND
10	DT2P	Image LVDS data
11	DT2N	Image LVDS data
12	GND	GND
13	nSH_K1	SAMPLING&HOLD
14	nSH_K2	SAMPLING&HOLD
15	nENB	LD ENABLE signal
16	NC	NC
17	NC	NC
18	GND	GND

7. CN40 (Power_IF)

NO.	Signal	Description

1	TX_SENSING	Transcription F/B signal
2	TX_ENB	Transcription ENABLE
3	TX_PWM	Transcription print
4	CHGPWM	Changed print
5	DEVPWM	Developer print
6	+24V	24V Power
7	+24V	24V Power
8	+24V	24V Power
9	GND	GND
10	GND	GND
11	+5V	5V Power
12	GND	GND
13	HR_PSU	Fuser heat ON signal
14	XZEROX	Zero cross signal
15	PS_24V	24V Power save signal

8. CN25 (MAIN FAN)

NO.	Signal	Description
1	MAIN_FAN	FAN ON signal
2	MAIN_FAN_BACK	Detects arrival of set RPM
3	GND	GND

9. CN49 (SUB FAN)

NO.	Signal	Description
1	SUB_FAN	SUB FAN ON signal
2	SUB_FAN_BACK	Detects arrival of set RPM
3	GND	GND

10. CN74 (DEV FAN)

NO.	Signal	Description
1	DEV_FAN	DEV FAN ON signal
2	DEV_FAN_BACK	Detects arrival of set RPM
3	GND	GND

11. CN27 (MPT SOL)

NO.	Signal	Description
1	+24V	24V Power
2	MPT_SOL_L	Multipurpose feeding solenoid ON

12. CN26 (EXIT SOL)

NO.	Signal	Description
1	+24V	24V Power
2	EXIT_SOL_L	Feeding solenoid ON

13. CN28 (TRAY_E-Clutch)

NO.	Signal	Description
1	+24V	24V Power
2	E-Clutch_L	Feeding E-clutch ON

14. CN4 (UI_IF)

NO.	Signal	Description
1	+5V	5V Power
2	UI_RXD1	UART RX: Data signal from UI
3	UI_TXD1	UART TX: Data signal to UI
4	GND	GND
5	GND	GND
6	POWER BUTTON	UI POWER BUTTON signal
7	GND	GND
8	+5V	5V Power
9	POWER BUTTON _LED	UI POWER BUTTON LED Signal

15. CN61 (LCD_IF)

NO.	Signal	Description
1	LCD_CSB_BUF	Chip select signal to LCD
2	LCD_RSTB_BUF	Reset signal to LCD
3	LCD_RS_A0_BUF	Command and data signal to LCD
4	LCD_SCK_BUF	Clock signal to LCD
5	LCD_DO_BUF	Data signal to LCD
6	LCD_Backlight	LCD_backlight ON signal

16. CN42 (Micro Switch)

NO.	Signal	Description
1	+24V	24 Power
2	+24V_SW	24V power from switch

17. CN36 (Input_S)

NO.	Signal	Description
1	INPUT_S	Paper return detection
2	GND	GND
3	+5V	5V Power

18. CN24 (EMPTY_MPT_S)

NO.	Signal	Description
1	EMPTY_S	Tray paper detection
2	GND	GND
3	+5V	5V Power
4	MPT_S	MPT paper detection
5	GND	GND
6	+5V	5V Power

. 19. CN45 (FULL STACK_S)

NO.	Signal	Description
1	FULL STACK_S	Full paper stack detection
2	GND	GND
3	+5V	5V Power

20. CN13 (Fuser Exit_S)

NO.	Signal	Description
1	THERMISTER	Fuser temperature detection
2	GND	GND
3	FUSER_S	Paper output detection
4	GND	GND
5	+5V	5V Power

21. CN29 (Accufeed Full_S)

NO.	Signal	Description
1	Accufeed_Paper_LOW	Paper Low detection sensor
2	GND	GND
3	+5V	5V Power
4	Accufeed_Paper_HIGH	Paper High detection sensor
5	GND	GND
6	+5V	5V Power

22. CN12 (Paper Size Detect Switch)

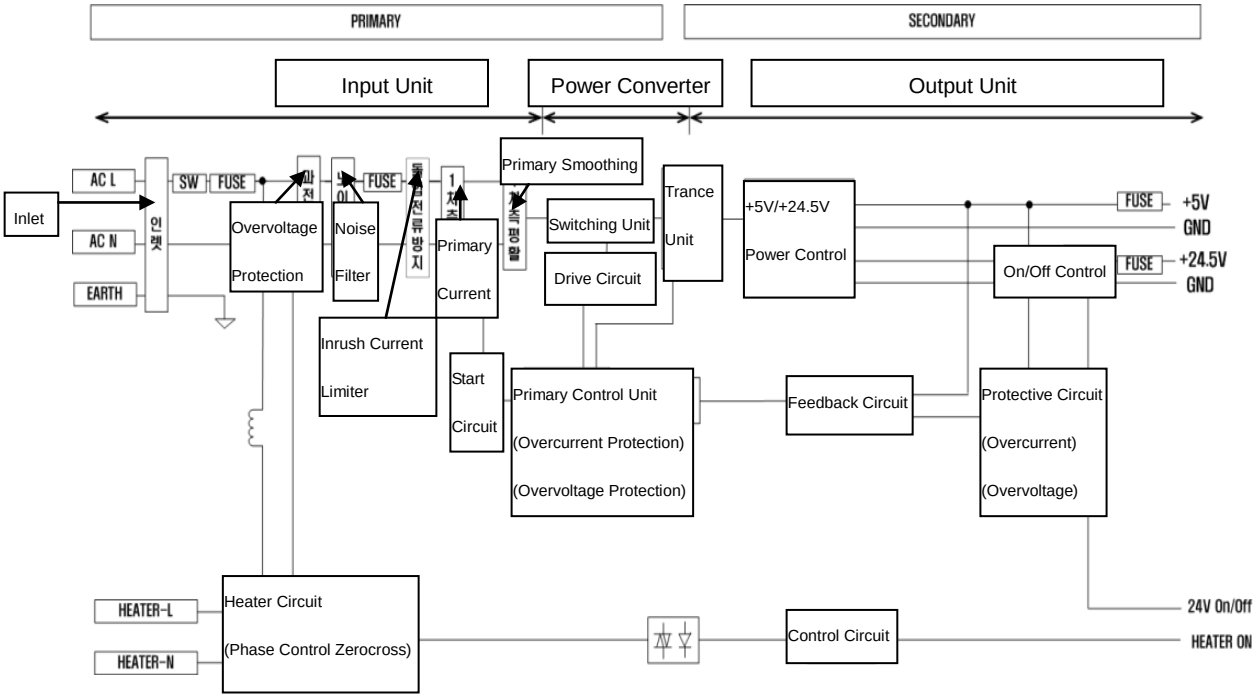
NO.	Signal	Description
1	Paper_Size_Detect_SW3	Paper size detection sensor
2	GND	GND
3	Paper_Size_Detect_SW2	Paper size detection sensor
4	Paper_Size_Detect_SW1	Paper size detection sensor

23. CN77 (AccuFeed DC-Motor & Encoder_S)

NO.	Signal	Description
1	+5V	5V Power
2	AccuFeed_Motor_ENC	DC motor encoder detection sensor
3	GND	GND
4	+24V	24V Power
5	AccuFeed_Motor_ON	DC Motor ON signal

LVPS Components and Main Functions

Block Diagram of Components



Components and Basic Functions

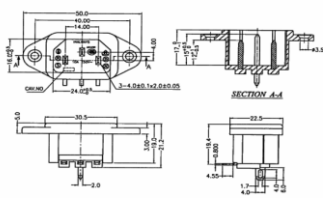
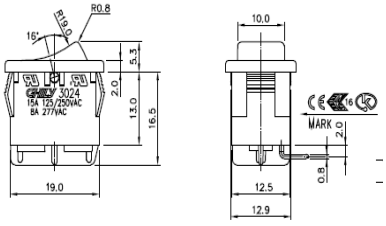
Basic LVPS components and their functions are as follows.

1. AC Switch: Open only one AC line (1-Pole type)
2. Varistor: Prevent rear circuit damage by short circuiting it when over current leads in to input
3. BRIDGE DIODE / MAIN CAP : Rectify AC waves to DC
4. Noise Filter: Prevent noise lead in at input section
5. Photocoupler: Perform feedback to maintain output constant voltage
6. Photo Triac: Control the heater in the machine to turn on and off
7. Fuse (1^{st} & 2^{nd}): Protect rear circuit on over current lead in

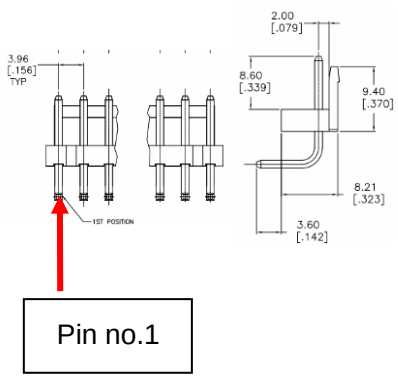
Pin Array

1. INLET + AC SW

Connector No.	Connector Name	Manufacturer	Image

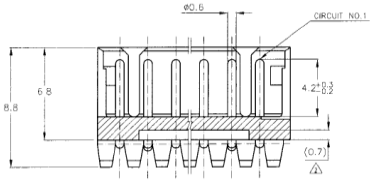
INLET	0707-1-C7D Or Equivalent	INALWAYS	
AC SW	3024- P2T7SBKBK (SPST) Or Equivalent	CHILY	 1pole SW

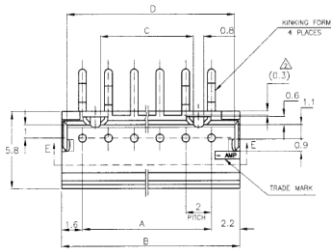
2. Heater Connector

Connector No.	Connector Name	Pin No.	Signal Name	Image
CN2	HEATER CONNECTOR 1744056-3 (AMP) Or Equivalent	1	HEATER_L	 Pin no.1
		2	(removed)	
		3	HEATER_N	

* Spacing for no. 2 pin from total of 3 pins (to secure isolation distance)

3. DC Connector

Connector No.	Connector Name	Pin No.	Signal Name	Image
CN3	DC CONNECTOR 1-292250-5	1	TX SENSING	
		2	TX EN	
		3	TX PWM	

	(AMP) Or Equivalent	4	CHG PWM	
		5	DEV PWM	
		6	+24.5VS	
		7	+24.5V	
		8	+24.5V	
		9	GND	
		10	GND	
		11	+5V	
		12	GND	
		13	HEAT ON	
		14	Z.C	
		15	24V OFF	

Standard

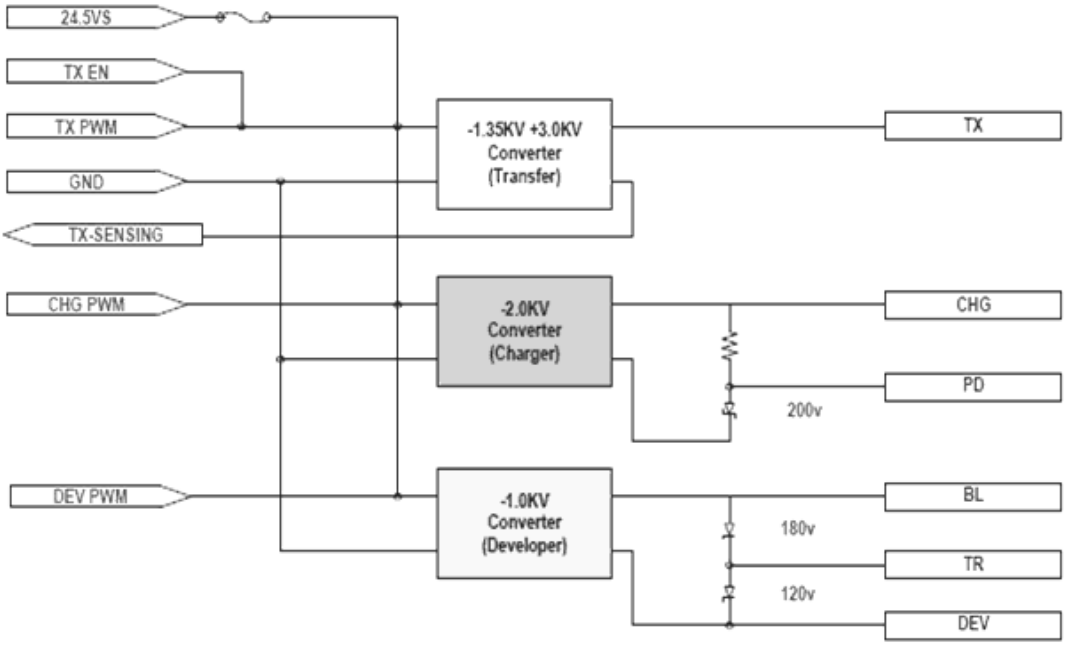
Parameter	Range III (230V)
Input Frequency (nominal)	Single phase, 50/60±3 Hz
Voltage Range (nominal)	220 ~ 240Vac
Voltage (min-max)	198 ~ 264Vac
*Nondestructive Voltage	187 ~ 276Vac
Input Current	AC + DC : ≤3.9A, DC : ≤TBD
Input Power (Energy Saver Mode)	Over 55% efficiency on energy saver mode
Rush Current	≤ 50A 1/4 cycle, after complete discharge
EMC Filter	PCB fix
Protection	Fuse (T**6.3A** H 250V)
Heater On/Off control	Zero Crossing only, Turn-On
Power Factor	Over 0.5, on average load
Efficiency	Over 75%, on average load

		CH1	CH2	Note
Voltage (V)		+5.0Vdc	+24.5Vdc	
Voltage Range	Static Mutual Load Variation and dynamic load variation	+4.75V~+5.25V (-5%~+5%)	+22.05V~+26.95V (-10%~+10%)	
	Average Load	+4.75V~+5.25V (-5%~+5%)	+22.78V~+26.22V (-7.0%~+7.0%)	
Output Load Condition	DC Switch OFF	0.007A	-	-
	Cover Open	0.25A	0.025A	
	Energy Saver	0.07A	-	-
	Minimum Output Current	0.25A	0.05A	-
	Nominal Output Current	1.2A	3.1A	-
	Maximum Output Current	2.0A (**Maintain operation for minimum of 30 min.)**	3.5A (**Maintain operation for minimum of 30 min.)**	-
	Peak Output Current	-	6.0A	-
	2nd Rush Current (Surge Current)		20A (50uS min.)	
	Total Max. Output Power	10.0W	86W	
	Static Mutual Load Variation Condition	5V min – 24V max 5V max – 24V min		
Ripple and Noise Voltage		100mVp-p	300mVp-p	-
Over Voltage		Within voltage range	Within voltage range	-
Over Current Protection	Over current limit	**Fuse**	7A ~ 10A	-
	Restoration Method	Fuse Exchange	AC Reset	-
	Short circuit protection operation	Power Isolation	Power Isolation	-
Over Voltage Protection	Over voltage limit	7V	30V	-
	Restoration Method	AC Reset	AC Reset	-

* (1) Channels: 2 channels with 5V and 24V
  (2) Operate power isolation mode on OCP, OVP and other protect activations

HVPS Components and Main Functions

Block Diagram of Components



Pin Array

Refer to DC connector part from LVPS pin array.

Basic Functions

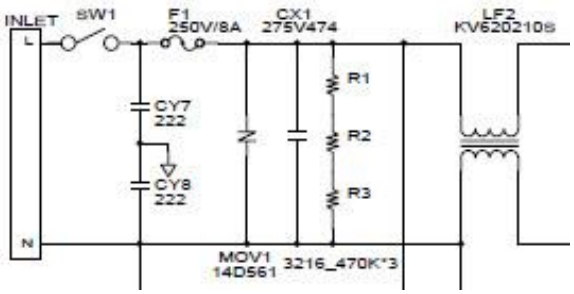
1. Channels: HVPS is composed with 4 DC-DC converters and with 7 channels of charging (CHG), drum (PD), development (DEV, TR, BL) and transfer (TX+, TX-)
2. Output Characteristics: Constant voltage method including transfer channels

3. Each of logic control is entered to each DC-DC converter and has PWM signals for converter control.
4. 24.5VS is supplied from LVPS. Front section of 24.5V is composed with safety interlock structure to prevent high voltage output of HVPS when cover is opened.
5. TX channel operates when TX enable signal is entered. TX channel has 2 channels of TX+ and TX-.
6. Enable signal basically applies -1350V to TX-.
7. TX-Sensing works as to detect 12μA current constantly.
   TX-Sensing signal delivers “LOW LEVEL” when transfer’s output current is lower than 12μA and “HIGH LEVEL” when it is higher than 12μA.
8. CHG PWM: It controls CHG and PD channel voltages. PD channel always maintains 200V versus GND using zener diode.
9. DEV PWM: It controls DEV, TR and BL channel voltages. TR and BL voltages use zener diode to always maintain DEV-120V and DEV-300V versus DEV output voltage

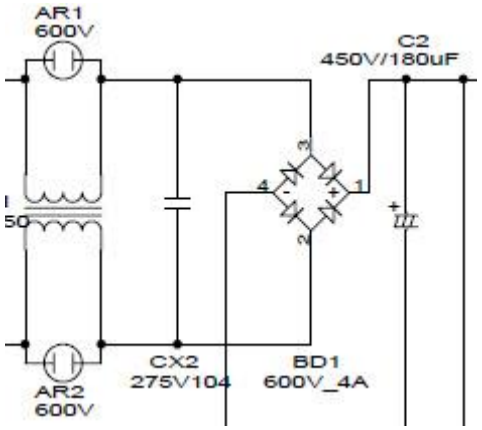
Categories	CHG	PD	DEV	TR	BL	-TX	+TX	TX-SENSING
Power Voltage	◦ **+24.5V ± 12.5% (+21.44V~+27.56V)**							
Power Current	◦ Max. 350mA							
PWM Signal	◦ Voh 5.0V Pull-up, Vol = Max. 0.8V (at Iol = 40mA, Vcc = 4.75V)							
Frequency	◦ 24.41KHz ± 1KHz							
Rated Output Voltage	-1690V	-200V	-620V	DEV-180V	DEV-300V	-1350V	+3000V	3.3V
Range	-250V ~ -2000V	-	-20V ~ -1000V			Enable	-400V ~ 3500V	-
Tolerance	±21V : -250V ~ -700V ±3% : -700V ~ -2000V	± 10V	±10V:-20V ~ -333V ±3%: -333V ~-1000V	±5%	±5%	±100V	±22V:-400V ~ 600V ±100V:600V~ 3500V	-
Rate Load	20MΩ ~ 1GMΩ		20MΩ ~ 1GMΩ			270MΩ ~ 1GMΩ	30 MΩ ~ 1GMΩ	-
Setup Output Voltage	-1690V ± 21V	-200V ± 10V	-620V± 10V	± 3%	± 3%	-1350V ± 60V At 450 MΩ (Active Low)	+3000V±100V	TX Output current **12 ± 1** μA

Circuit Diagram-LVPS Input Section

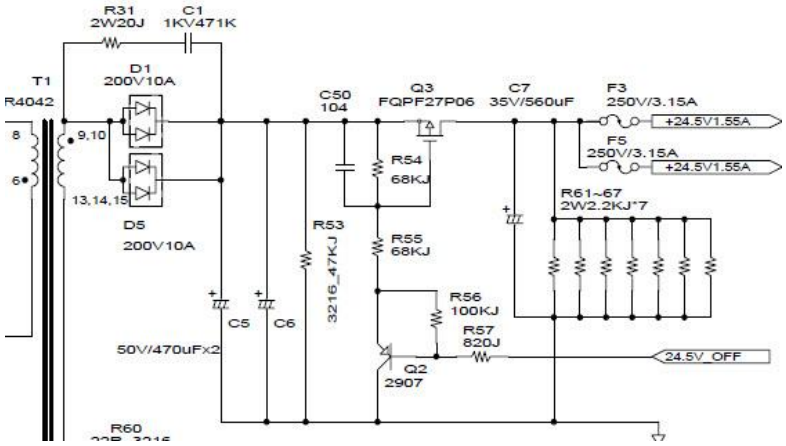
1. Line Filter Unit



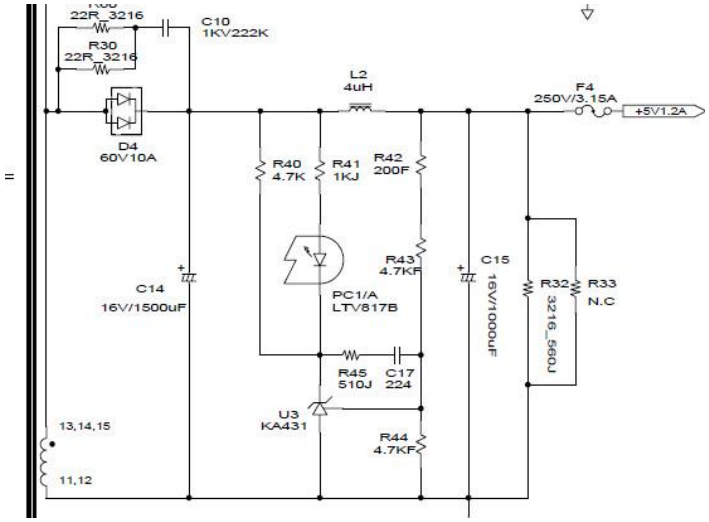
2. AC-DC Rectification Unit



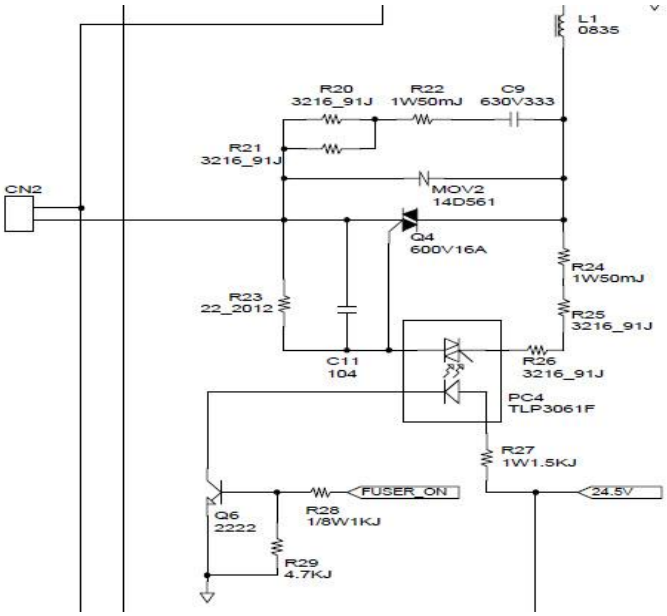
3. 24V Output Unit



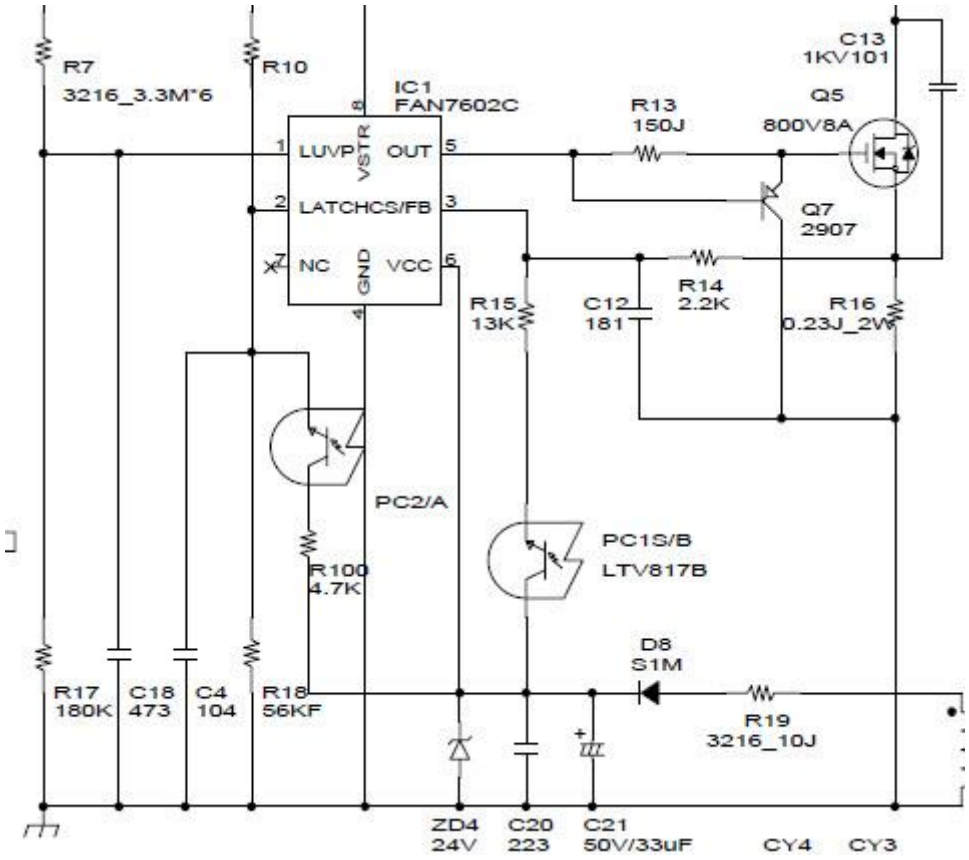
4. 5V Output Unit



5. AC Drive Section

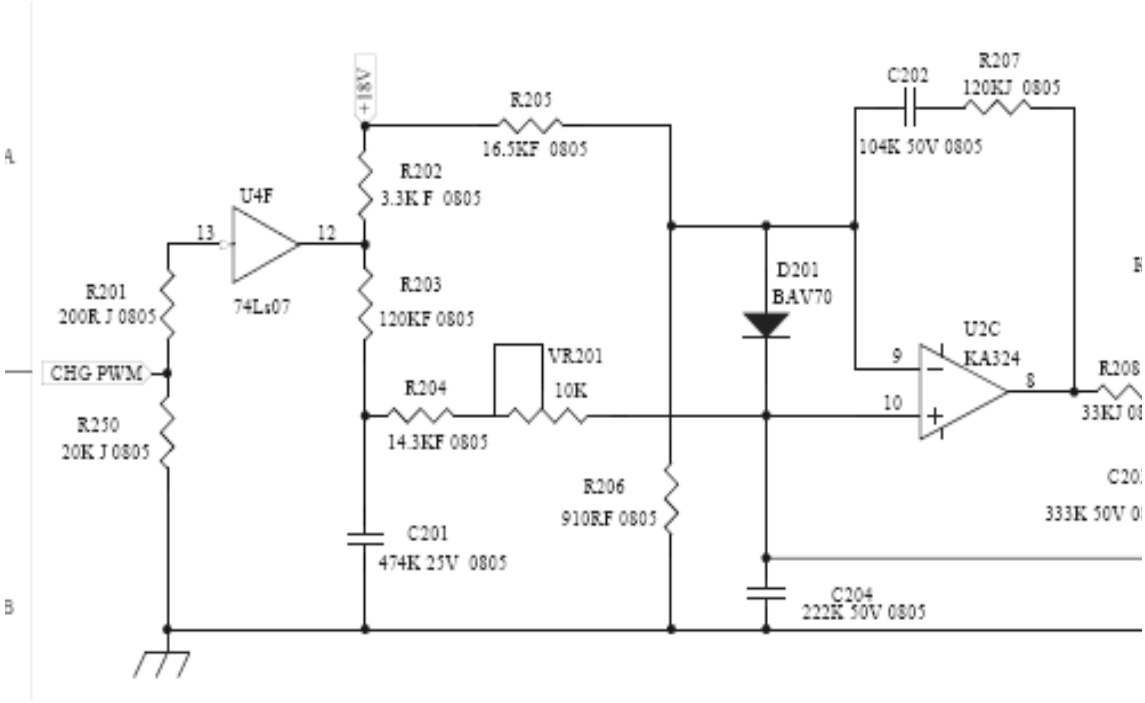


6. Switching Unit

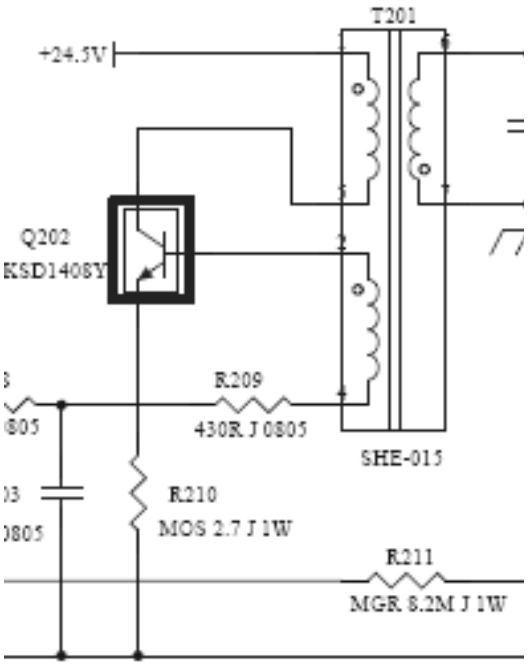

R7
3216_3.3M*6
R10
IC1
FAN7602C
8
VSTR
1
LUVP
OUT
5
2
LATCHCS/FB
3
7
NC
GND
VCC
6
4
R13
150J
Q5
800V8A
C13
1KV101
Q7
2907
R14
2.2K
R15
13K
C12
181
R16
0.23J_2W
PC2/A
PC1S/B
LTV817B
R100
4.7K
D8
S1M
R17
180K
C18
473
C4
104
R18
56KF
R19
3216_10J
ZD4
24V
C20
223
C21
50V/33uF
CY4
CY3

Circuit Diagram-HVPS Input Section

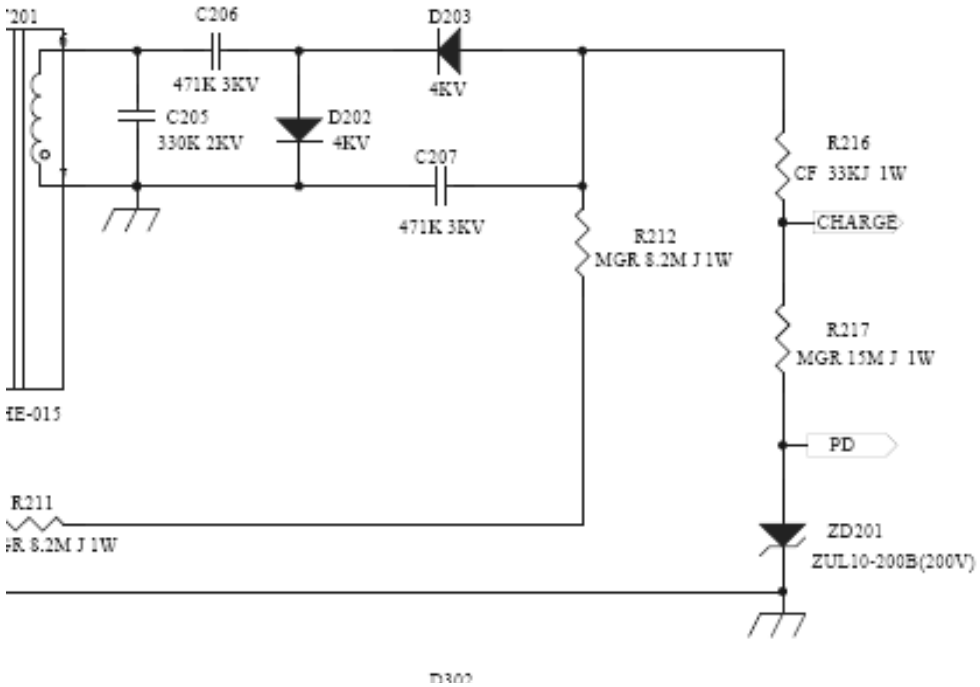
1. PWM Input Section



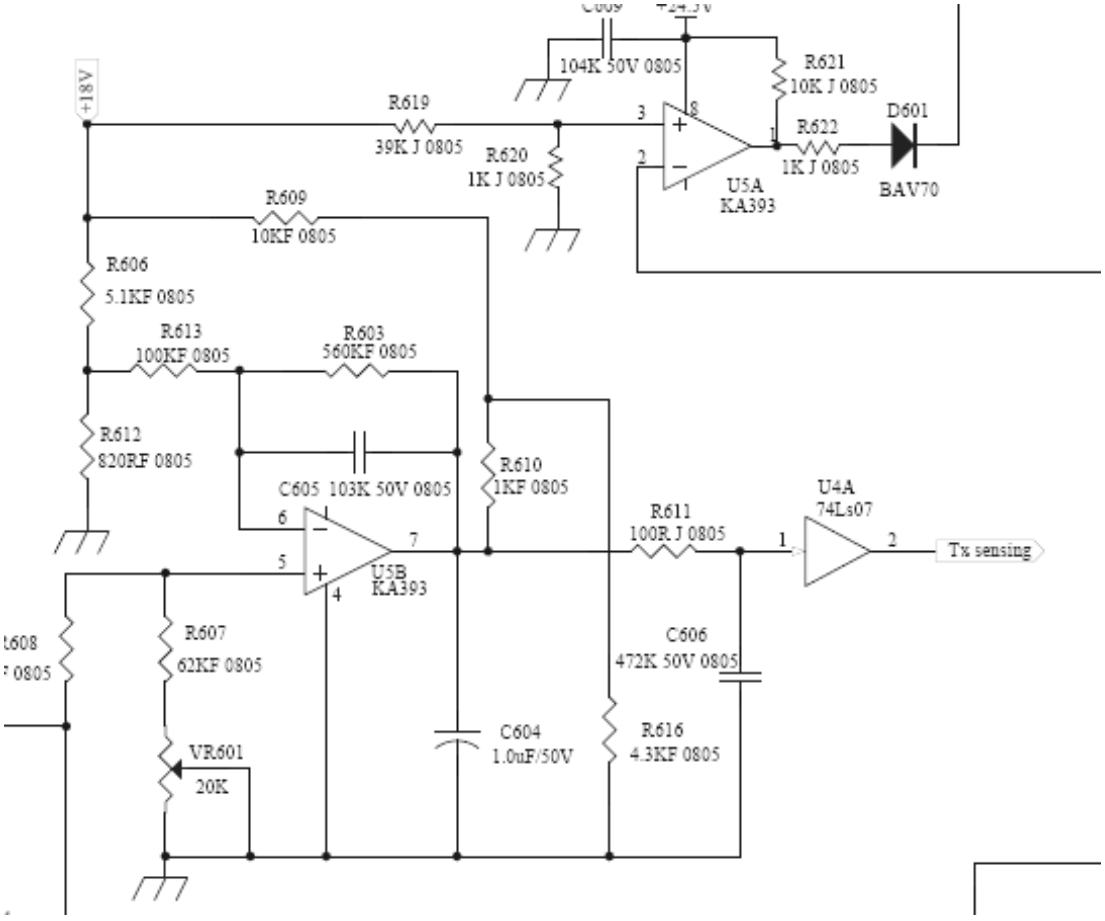
2. RCC Control Drive Section



3. High Voltage Output



4. TX-SENSING Unit



Replacement and Adjustment

Before Use

⚠CAUTION

Before installing options, please proceed with the followings:

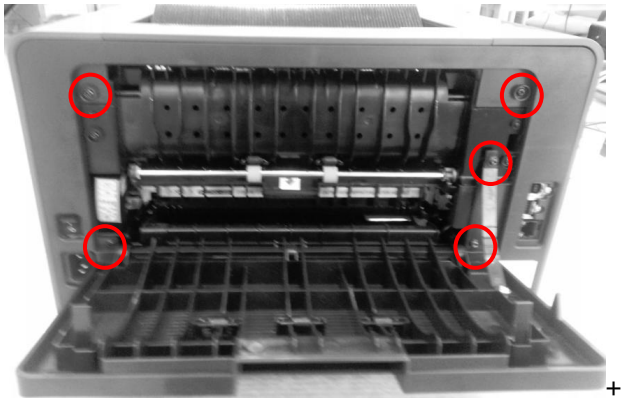
- If there are any printing jobs, print all jobs in the printer buffer.
- Turn the main power switch off and remove power cord and network cable from the machine.
- Be careful not to lose bolts when disassembling and see harness path to handle paths identical when reassembling.
- Assembly should be in reverse order of disassembling.

External Cover

Rear Door and Cover

1. Open rear door [A].

2. Remove 5 bolts and pull forward to remove rear door and cover from the main body.



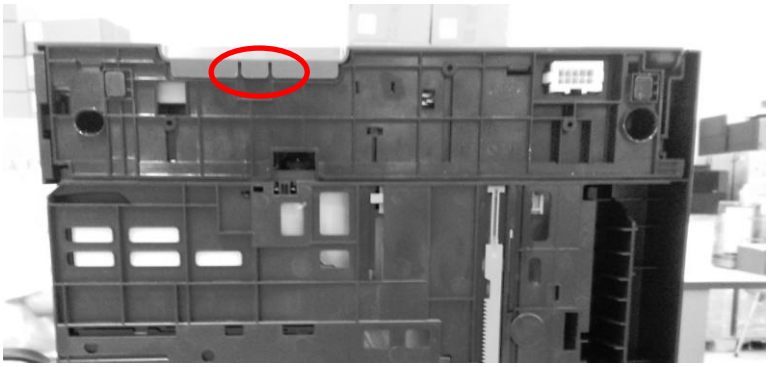
⚠CAUTION

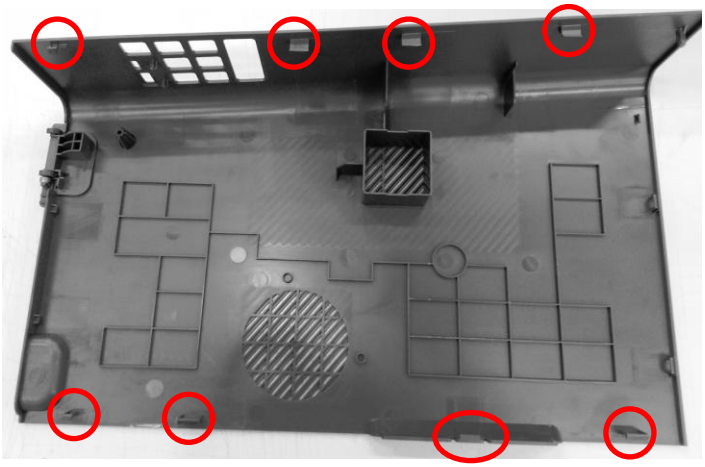
- When removing rear cover from the main body, be careful not to damage 4 hooks inside the cover.

Left Cover

1. Remove rear door and cover from the main body.

2. Open front cover and unlock the hook under the main body. Pull cover up to separate from the main body.



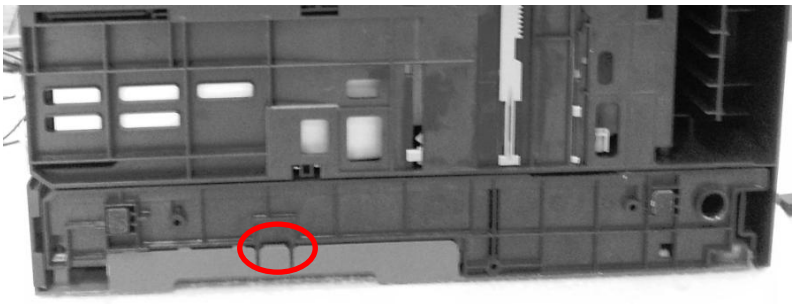


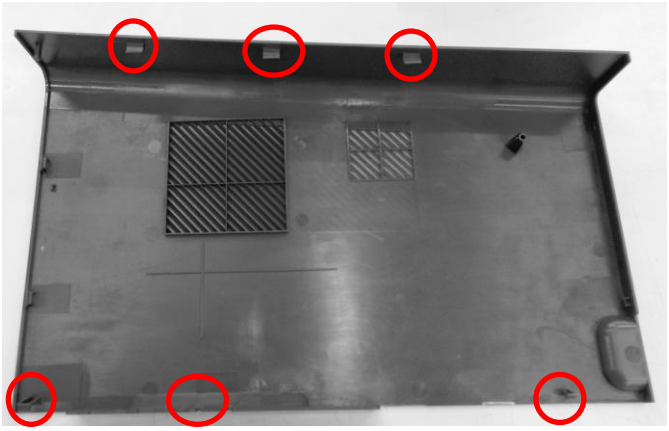
⚠CAUTION

- Be careful not to damage 8 hooks inside the cover when removing the left cover.

Right Cover

1. Remove rear door and cover from the main body.
2. Unlock the 4 hooks under the main body and pull the cover to separate from the main body.





⚠CAUTION

- Be careful not to damage the 7 hooks inside the cover when removing the right cover.

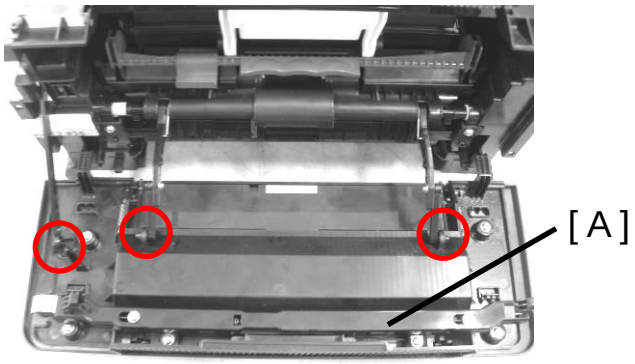
Control Panel

1. Remove the rear cover and open the front door.
2. Remove the left cover.
3. Remove 2 bolts at the top and bottom of Control Panel and the harness connected to the CN30 connector on main board and remove Control Panel from the frame.

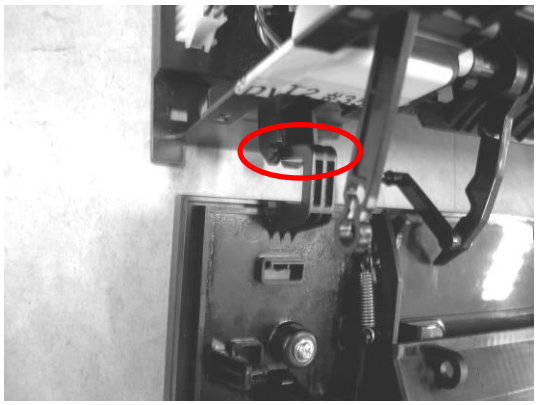
⚠CAUTION

- Be careful not to disconnect harness wires when removing the harness from the connector.
- Be careful not to damage flat harness on Control Panel.
- Refer to the harness path to main board to reassemble.

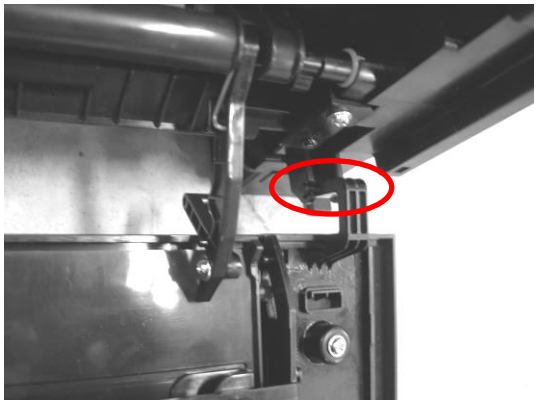
Front Door



1. Open front door [A].
2. Unlock 3 hooks on the left and right to remove links.

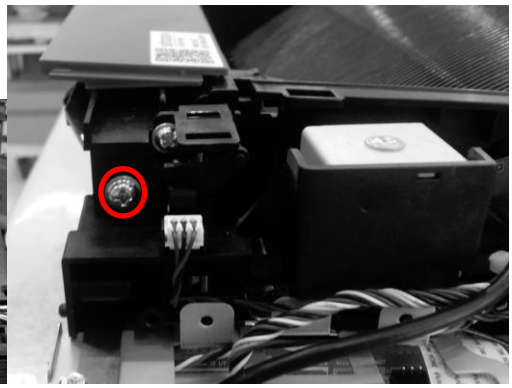


3. Push the left door hinge to the left and remove it from the frame.



4. Push the right door hinge also to the left and remove it from the frame.
   When reassembling, push the left and right hinges to frame's right side to fixate it and connect 3 links.

Top Cover

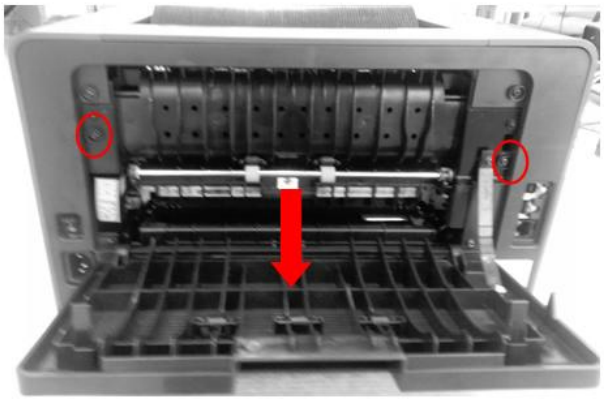


1. Remove the rear cover and the left and right covers from the machine.
2. Remove the Control Panel.
3. Remove 2 bolts on the top left of the frame.

4. Remove 2 bolts on the right side of the frame and lift the top cover up to remove it from the machine.

Output Cover

1. Remove the rear cover.
2. Remove 2 bolts on the left and right side on the frame and pull it forward to remove the output cover from the machine.



LSU

⚠WARNING

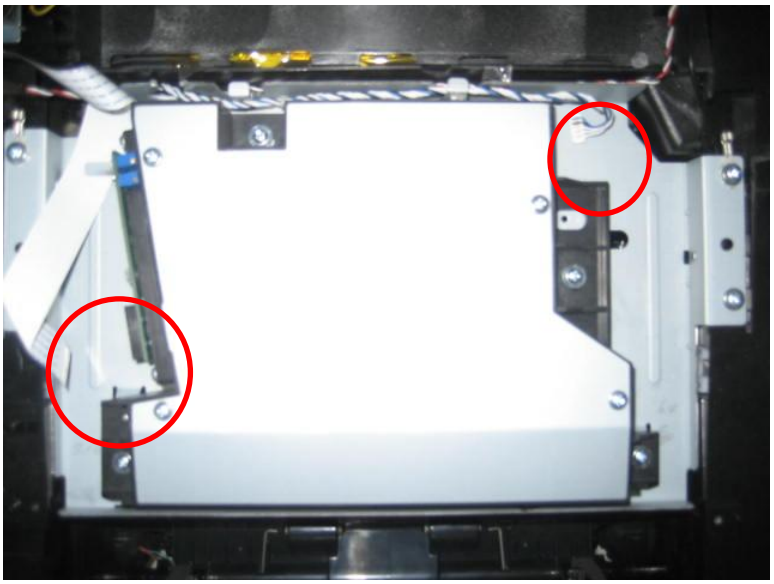
- Turn off main power and unplug before starting any procedure in this section. Failure to follow this warning may cause severe eye injuries by laser beam.

Removing Laser Unit

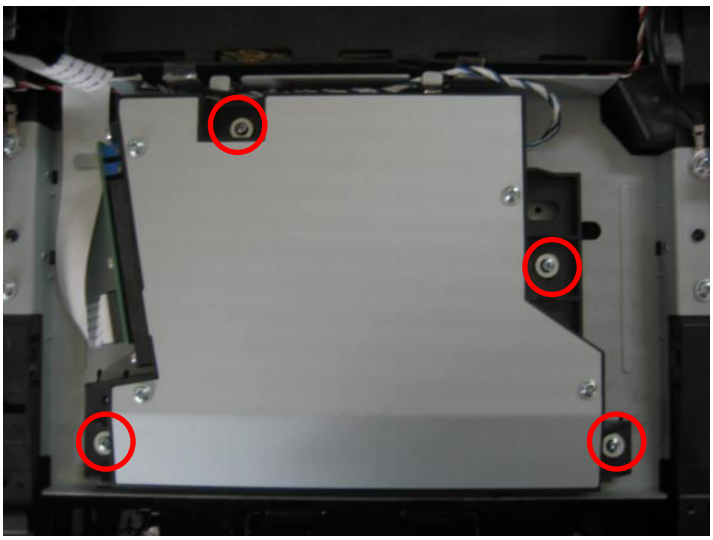
⚠CAUTION

Please check if main power switch has turned off and power cable is pulled from outlet before disassembling or adjusting the laser unit.

1. Open front door
2. Remove rear cover
3. Remove left and right covers
4. Remove top cover.
5. Remove flat cable from laser unit and harness connector from motor unit.

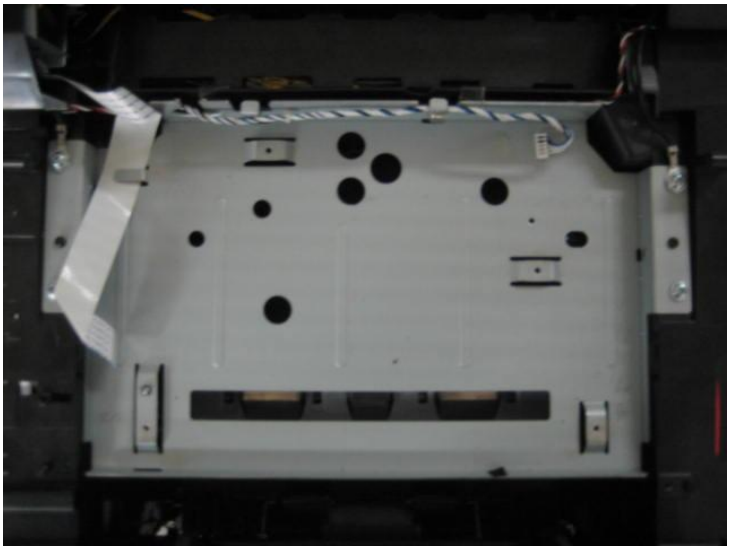


6. Remove 4 screws from laser unit.



7. Remove laser unit from frame.

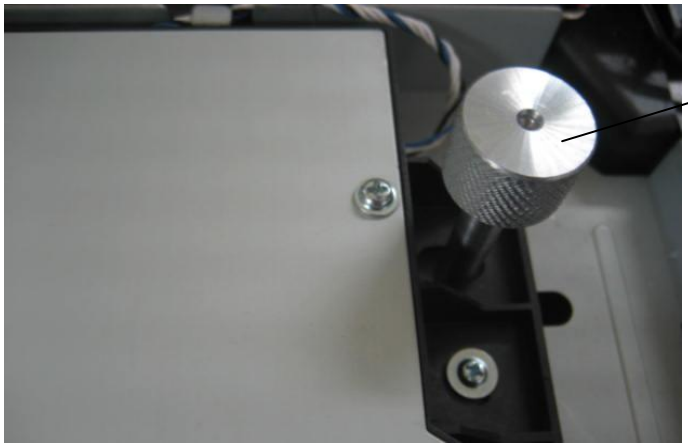
※ Laser unit removed

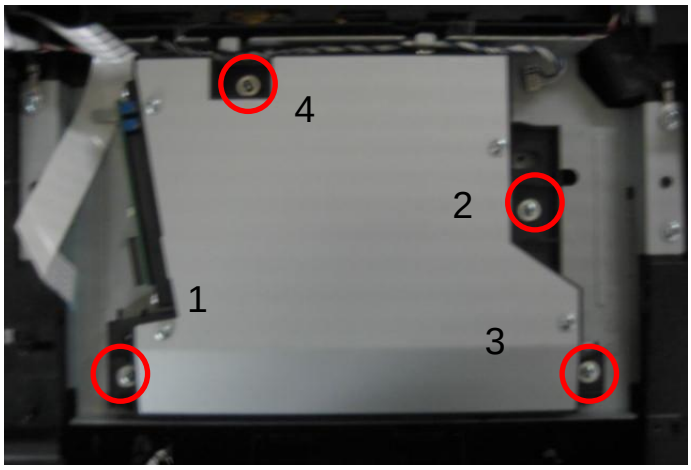


Installing Laser Unit

1. Place laser unit on frame.
2. Before tightening the laser unit with screws, use skew JIG [A] to position the laser unit and tighten 4 screws [B].

※ Screw order: 1, 2, 3, 4



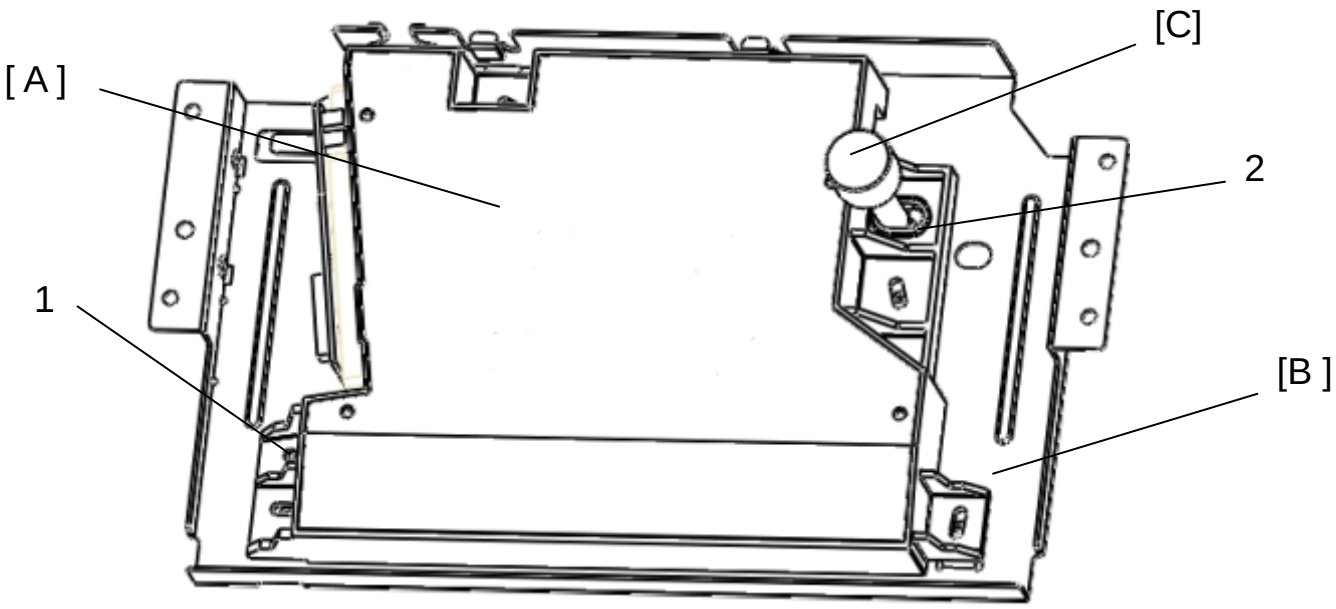


⚠CAUTION

When re-installing the laser unit, check the laser unit's alignment and proceed with the "Laser Unit Adjustment" before installing the top cover.

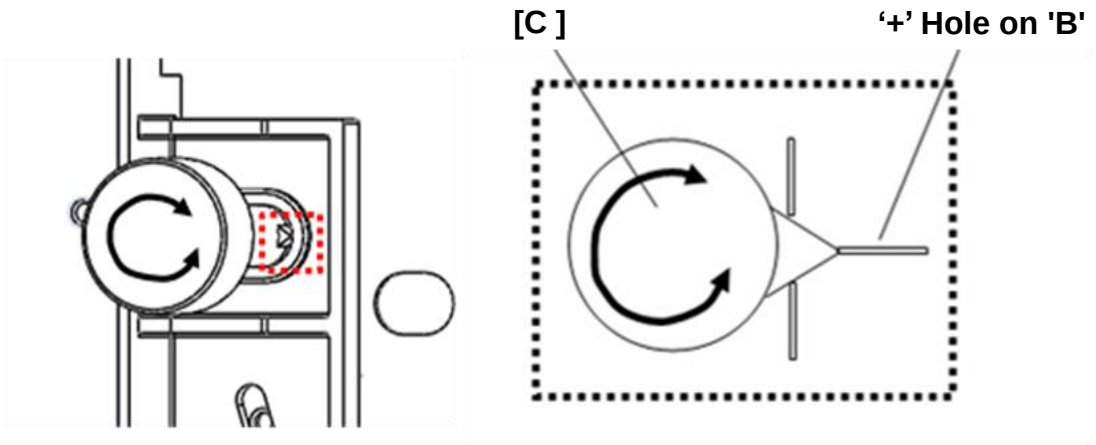
Aligning Laser Optical Housing Unit

When replacing the laser unit with a new one, please proceed with following procedures to align the laser unit.



A : Laser Unit	C : Skew adjusting JIG (cam format)
B : BKT STAY LSU	

1. Put ‘1’ hole on ‘A’ to ‘1’ EMBO shape on ‘B’
2. Put bump on ‘C’ floor through ‘2’ shape on ‘A’ to ‘2’ hole on B
3. Rotate ‘C’ to circumferential direction to match the end of the arrow on the bottom of ‘C’ with ‘+’ hole around ‘2’ hole on B.

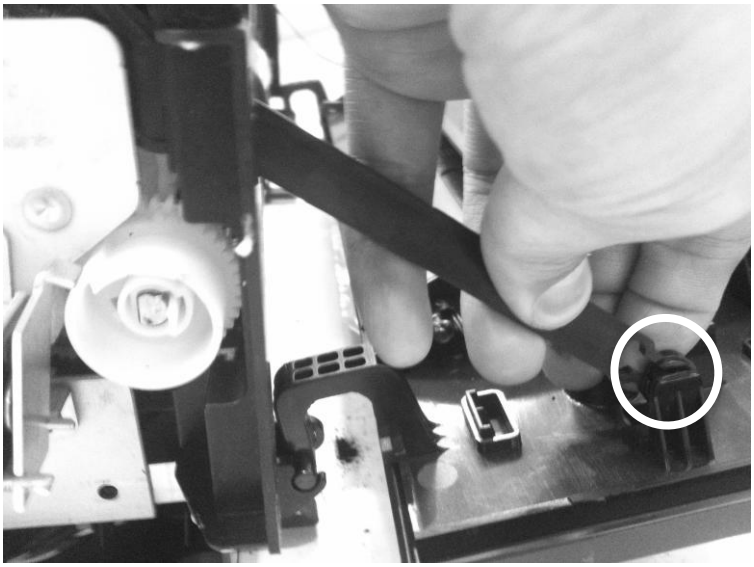


4. Tighten 4 screws and remove 'C'.

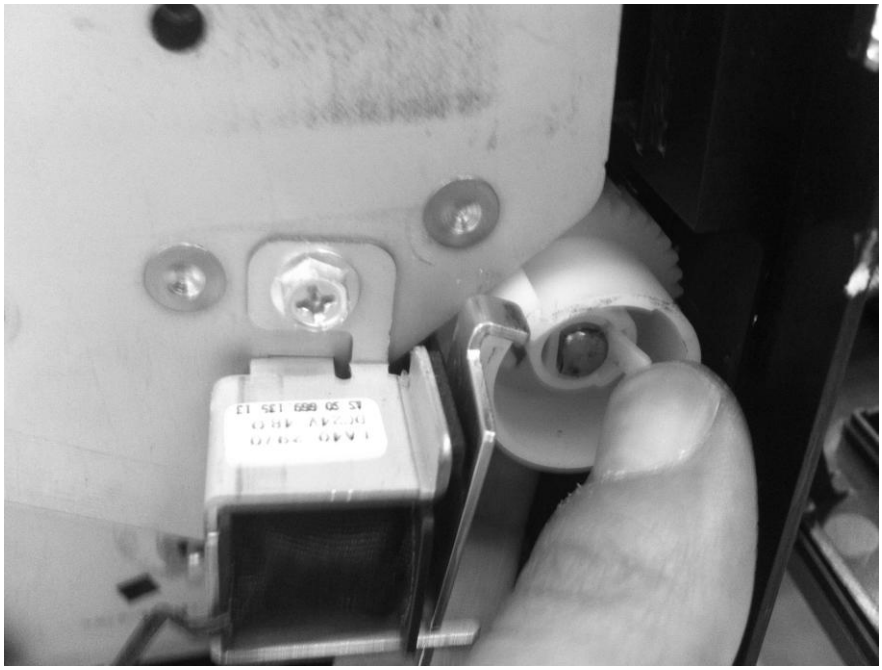
Main Driving A’ssy Unit

Removing Main Driving Gear Unit

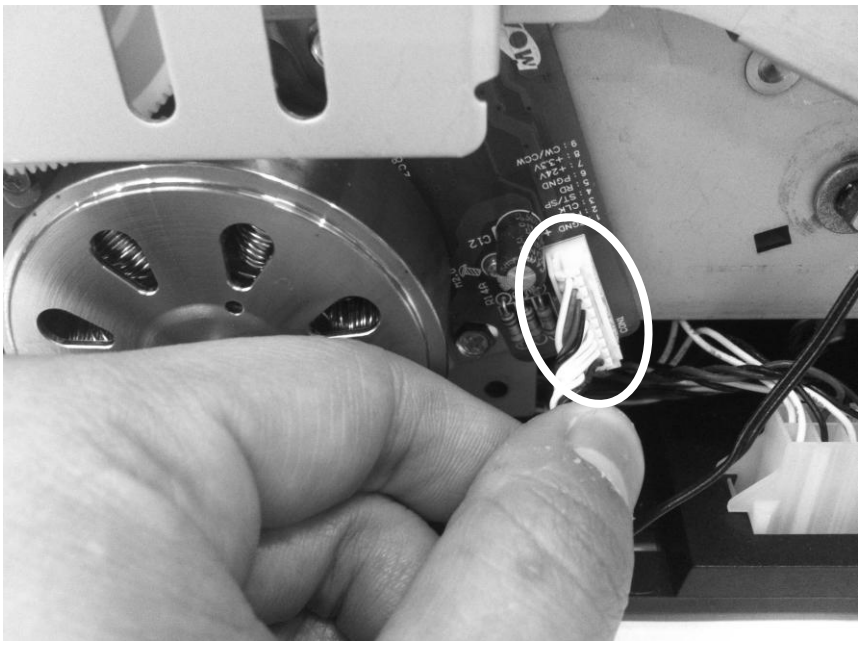
1. Remove link with front cover (towards machine).



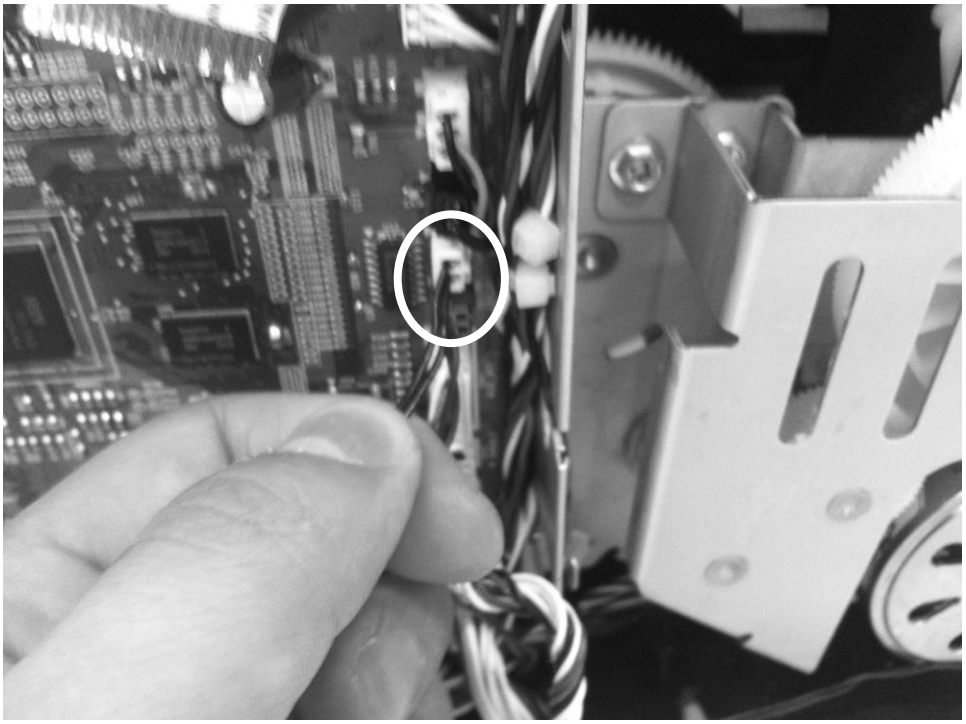
2. Remove MPT segment gear (outward pushing hook).



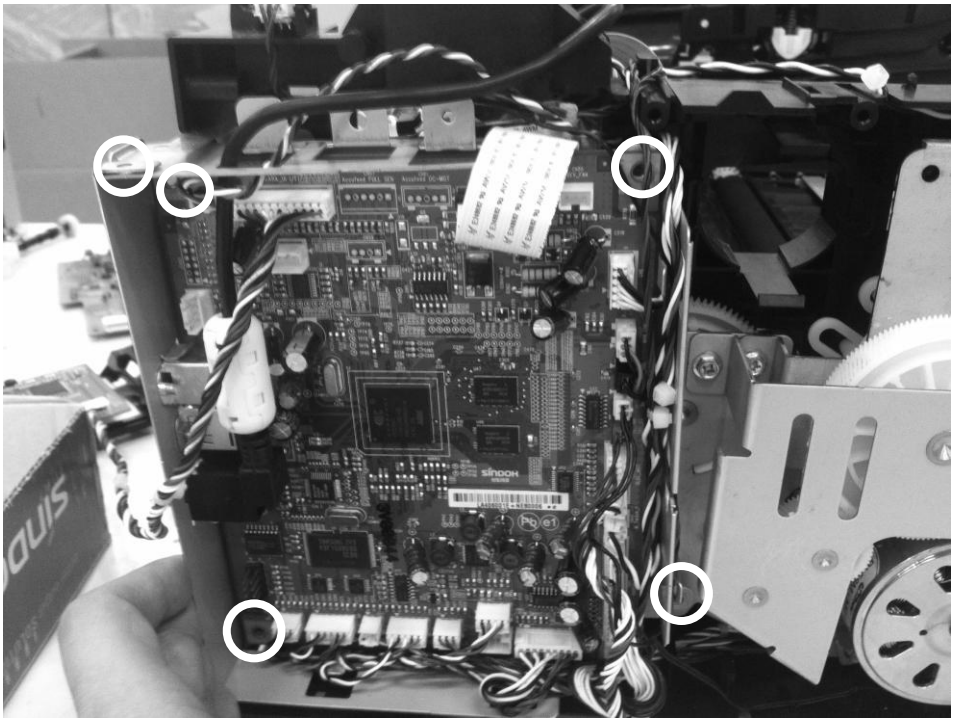
3. Remove motor harness connector (motor Part).



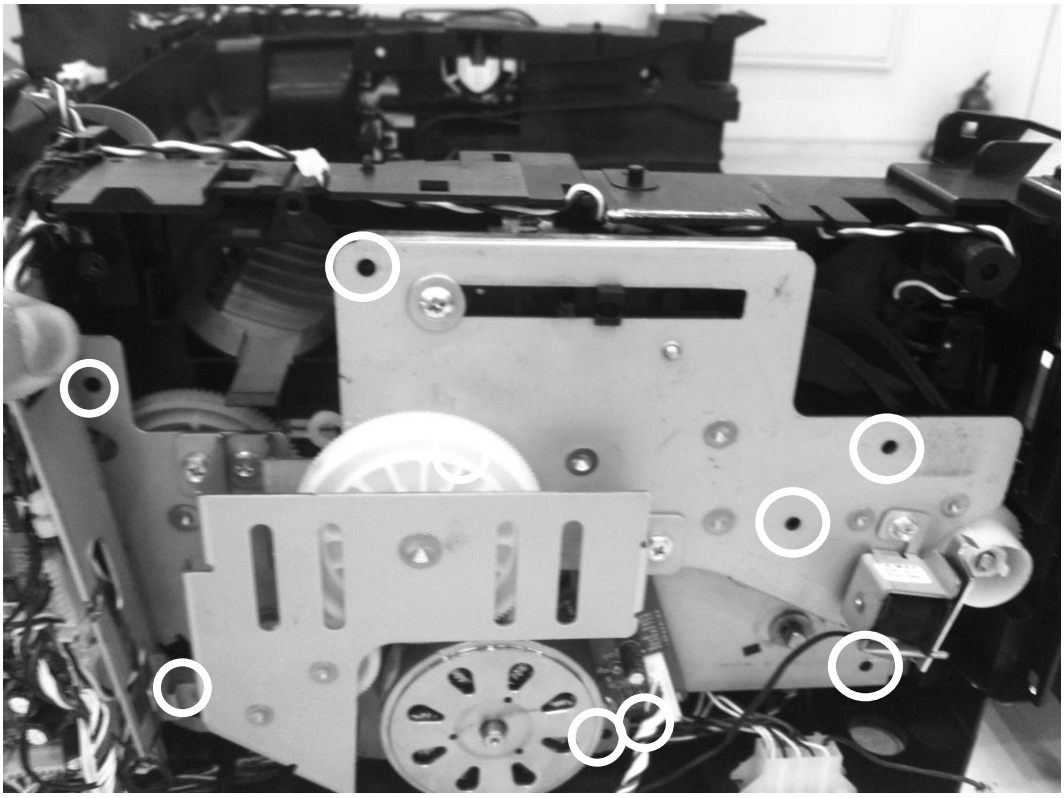
4. Remove MPT Solenoid connector (mainboard part)



5. Remove fixing bolts (5) from the mainboard BKT and push BKT to the left to reveal bolt heads.



6. Remove bolts (8) on the left frame that connect the driving A'ssy and remove entire A'ssy away from the machine.



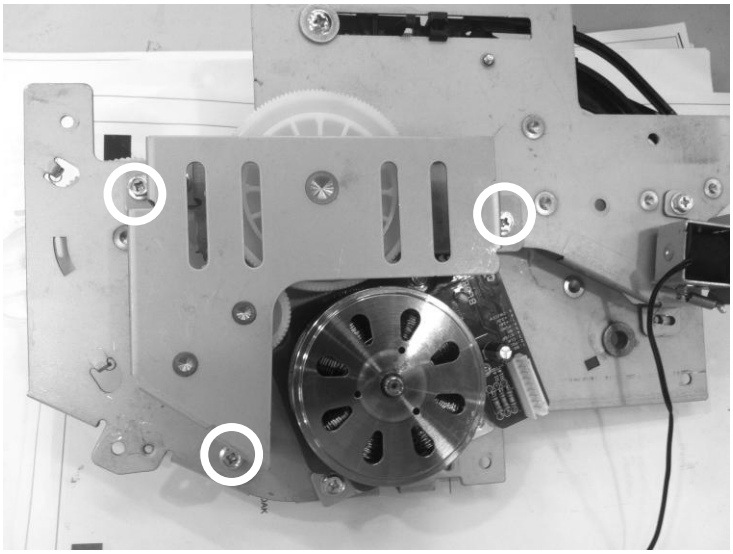
⚠CAUTION

Be careful not to damage or change gear when extracting A'ssy. Proceed in reverse

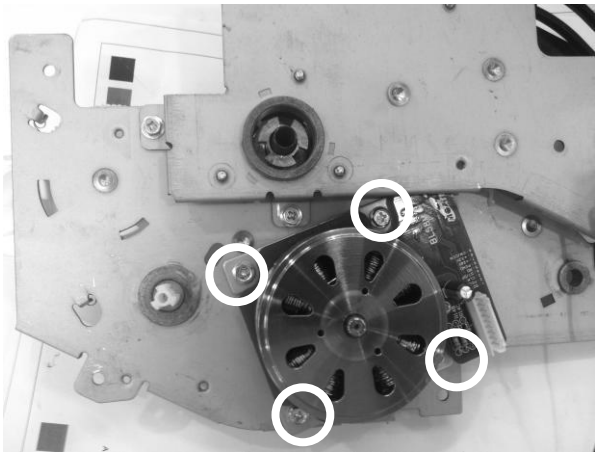
order to reassemble.

Removing Main Motor

1. Remove 3 bolts that fix the big gear BKT and remove the big gear BKT A'SSY.



2. Remove the 4 bolts that fix the motor.

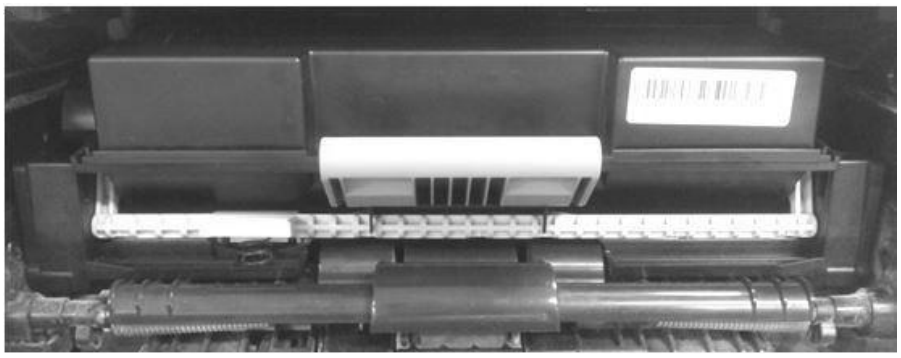


Reassemble in reverse order.

Drum and Developing Unit

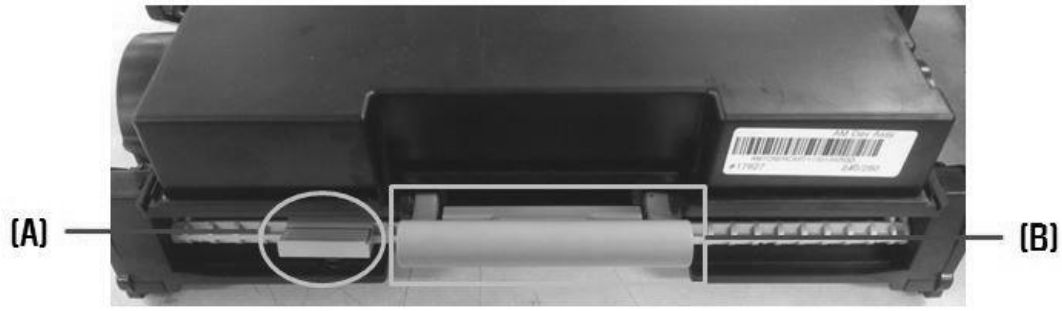
Removing Image Cartridge from Main Body

1. Open the front cover of the machine.

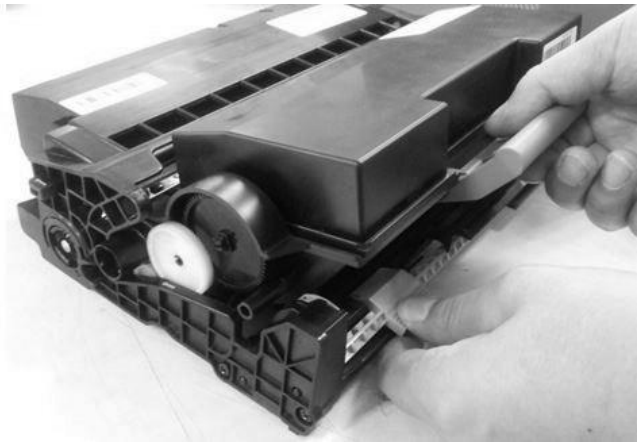


2. Hold the development unit handle and pull it upward to remove it.

Separating Drum Unit and Development unit

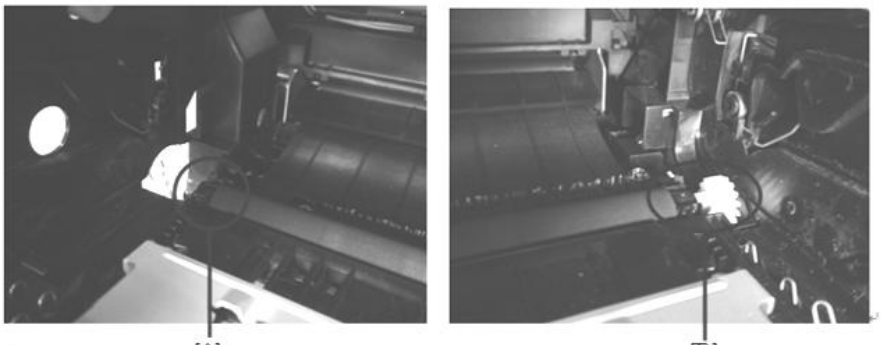


1. Press and hold the [A] development unit pressure release lever down and hold [B] handle.
2. Pull the development unit slightly tilted and remove the drum unit.



Transfer Roller

1. Remove the front door.
2. Remove the image cartridge.
3. Unlatch the left bushing latch on transfer roller and pull it up.
4. In the same manner, unlatch the right bushing latch and lift it up to remove the transfer roller.



⚠CAUTION

Be careful not to touch the transfer roller while disassembling.

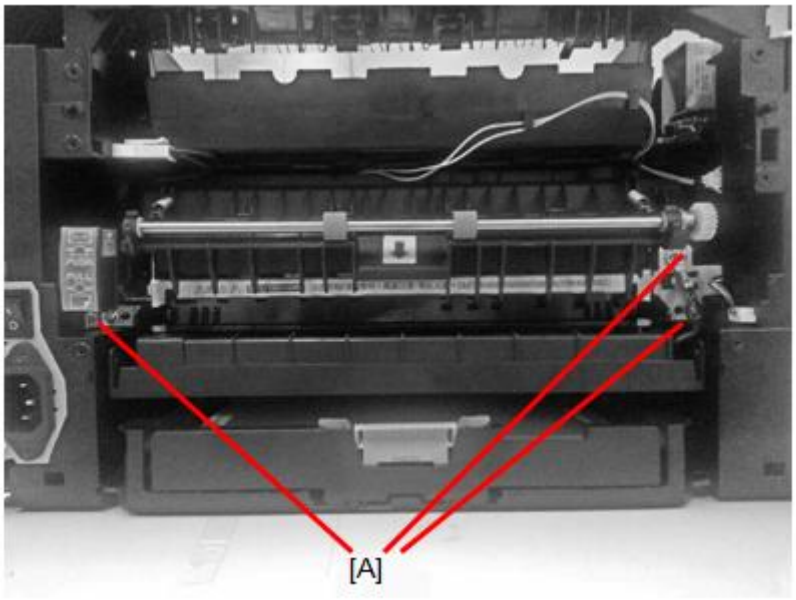
Fuser Unit

Removing Fuser Unit

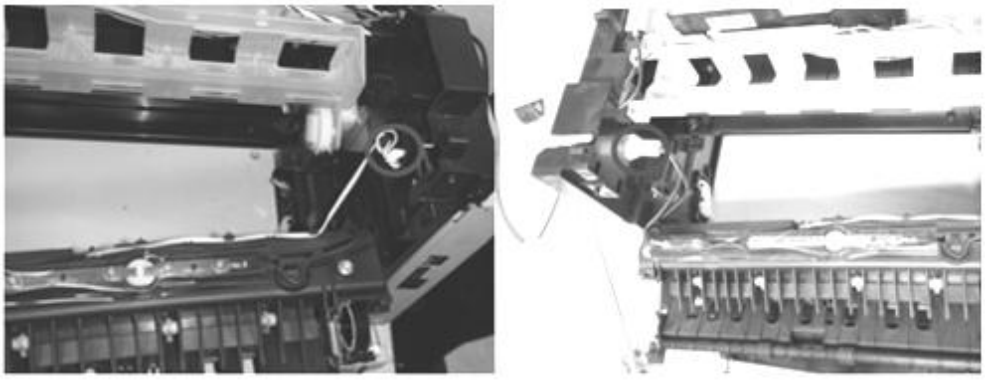
⚠CAUTION

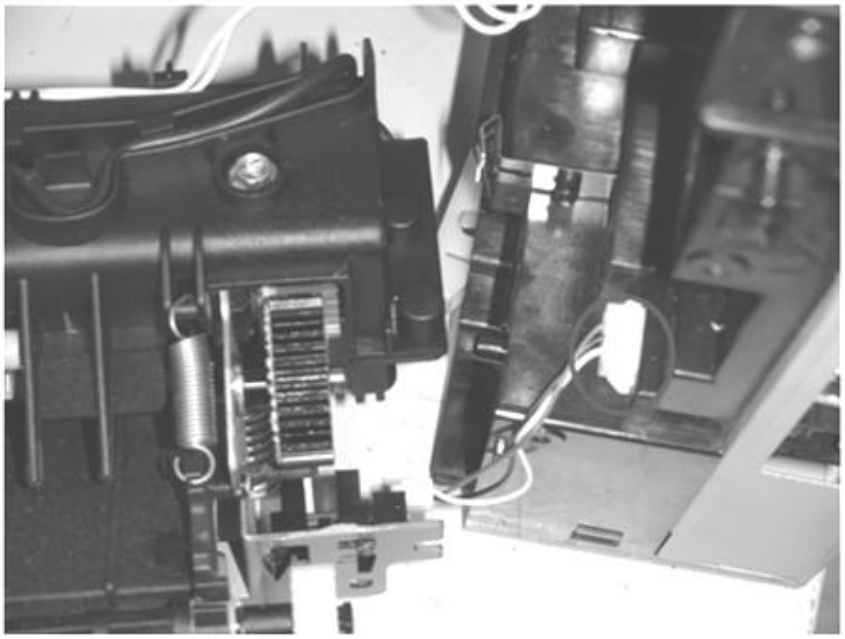
- Turn off main switch and wait until the fuser unit has cooled down before proceeding with any procedure in this section. You may get a severe burn from the fuser unit.
- Turn off the main power switch.

1. Open the front door
2. Remove the rear cover.
3. Remove the 3 screws [A].

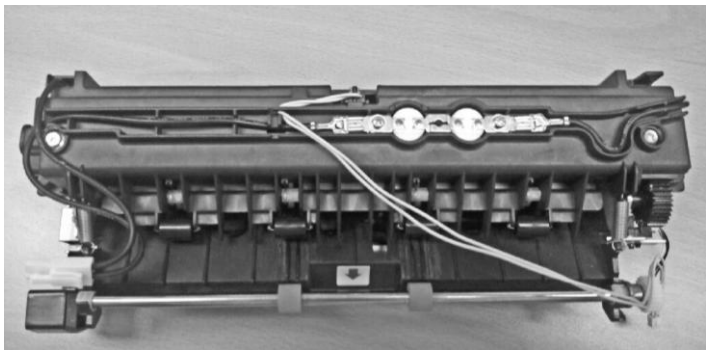


4. Separate 3 connectors marked by red circles.





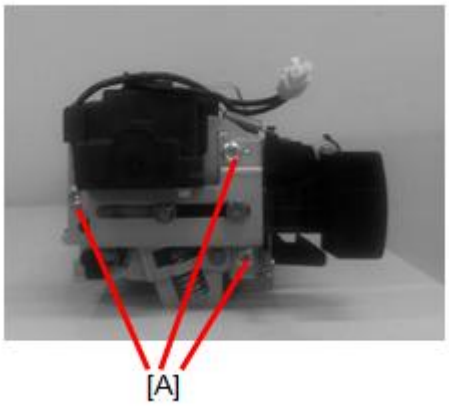
5. Remove fuser assembly from the machine.



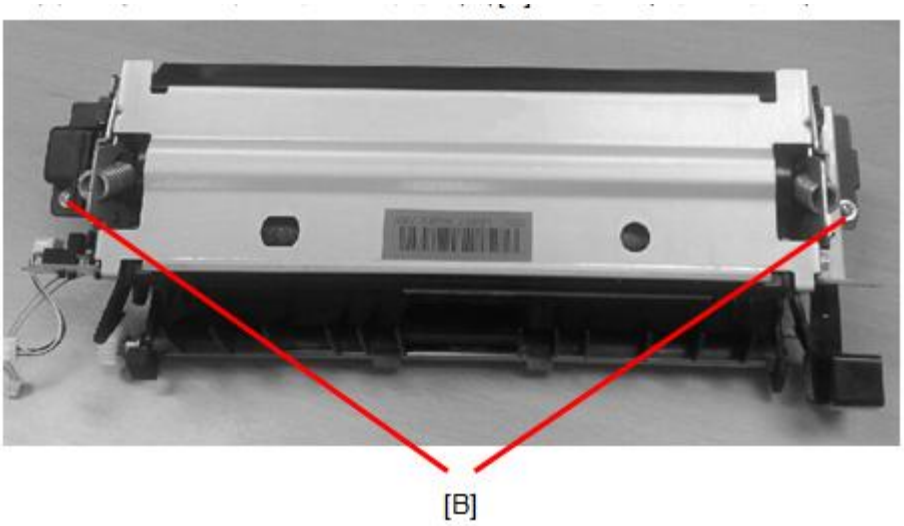
Assemble in revers order.

Replacing the Fuser Lamp

1. Open the front door
2. Remove the rear cover.
3. Remove fuser assembly from the machine.
4. Remove the 3 screws [A] and remove the pressure lifting lever bracket.



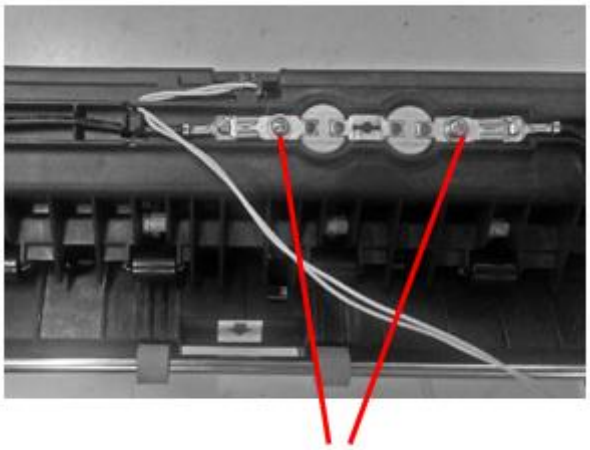
5. Remove 2 screws [B] to remove the 2 removed fuser assembly side covers.



6. Remove the cover and unscrew 2 screws fixing the fuser Lamp.

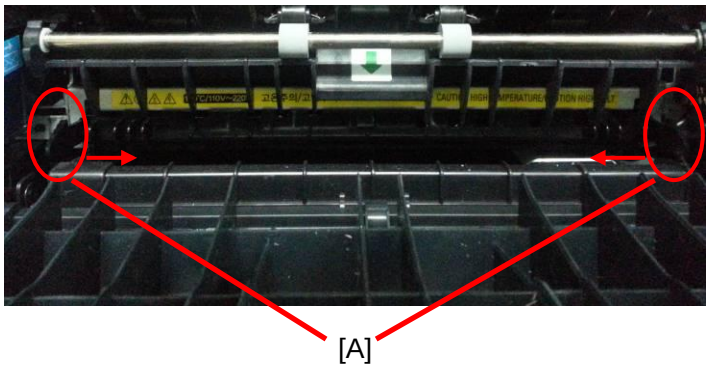
Replacing the Thermostat

1. Open front door and rear cover.
2. Remove fuser assembly.
3. Remove the 2 screws [A] fixing the thermostat.

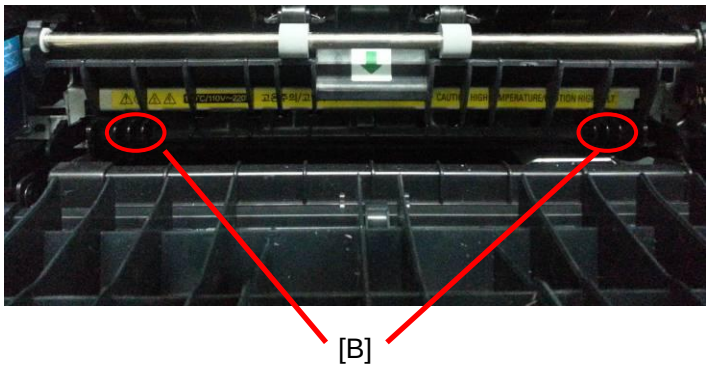


Replacing the Cleaning Roller

1. Open rear door.
2. Press red-circled parts [A] in the cleaning roller BKT and remove from the main body.



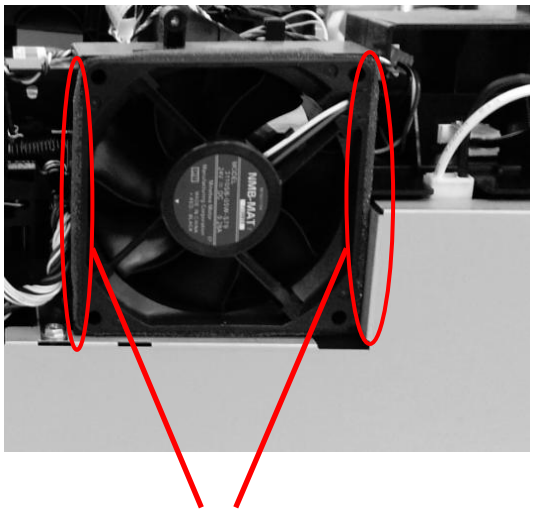
3. To assemble, place the cleaning roller A'SSY in the correct position and press [B] to fix.



Cooling Fan

1) Removing the Main Fan

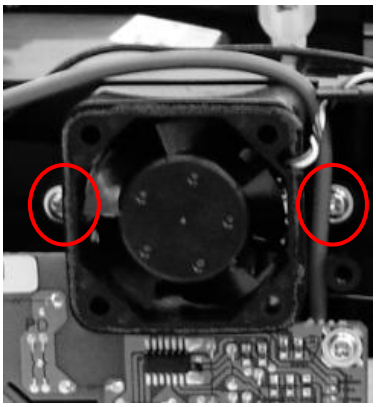
1. Open the front door and remove the right cover from the frame.
2. Hold [A] on the main fan and remove from the main body.



[A]

2) Removing the Sub Fan

1. Open the front door and remove the right cover from the frame.
2. Remove the 2 bolts tightened on the Sub Fan duct and remove from the right frame.

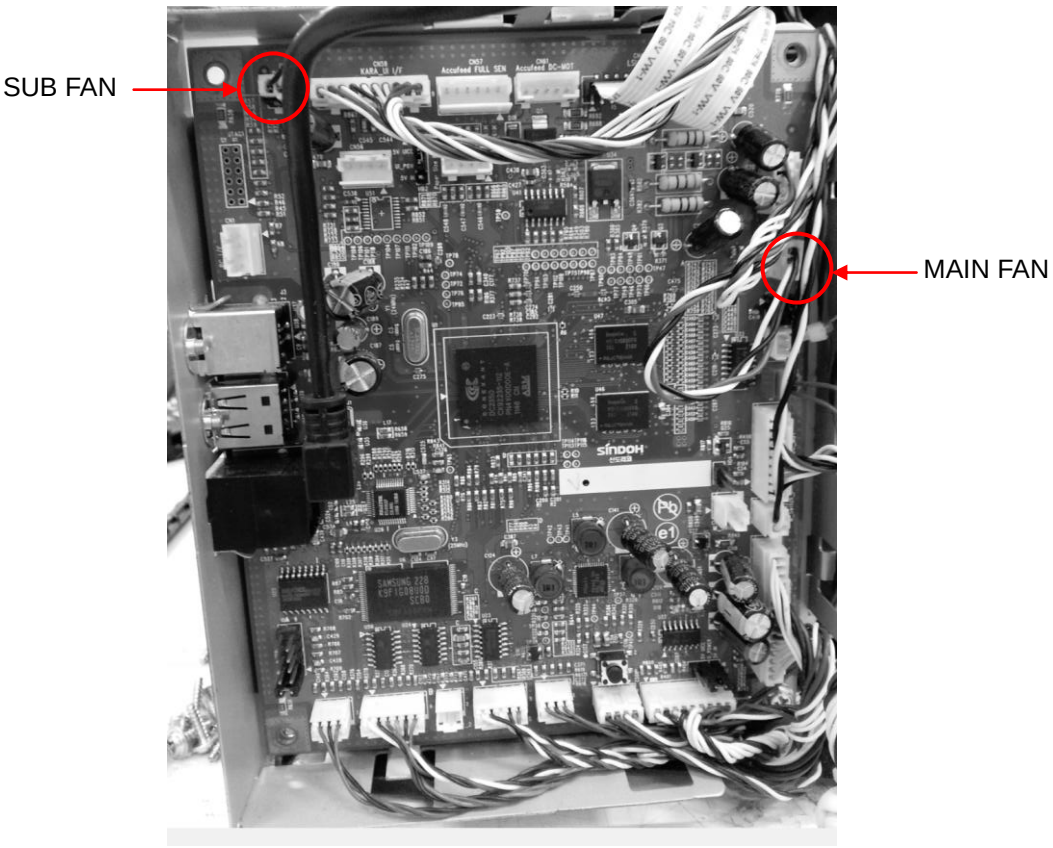


⚠CAUTION

Be careful not to switch left and right when reassembling the cooling fan.

3) Removing the Harness

1. Remove the main fan harness inserted in CN25 in the system card.
2. Remove the sub fan harness in CN49 in the system card.

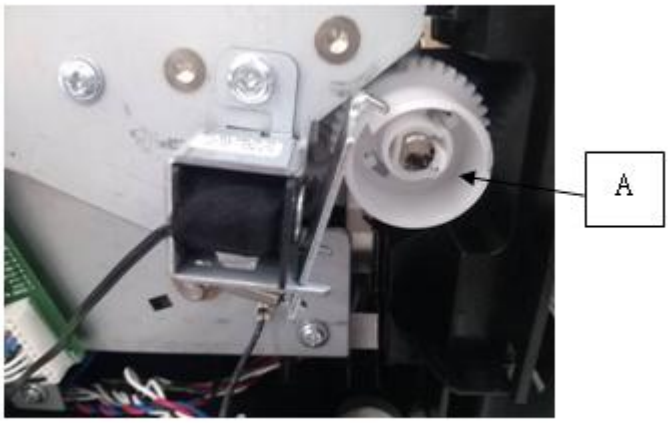

SUB FAN
MAIN FAN

Paper Feed

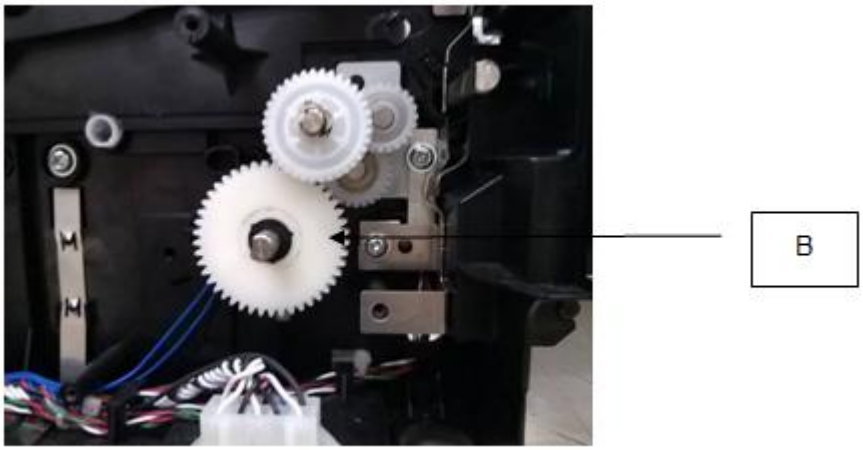
Separating Main Feed Roller (A610DN)

1. Open the front door and separate the link.

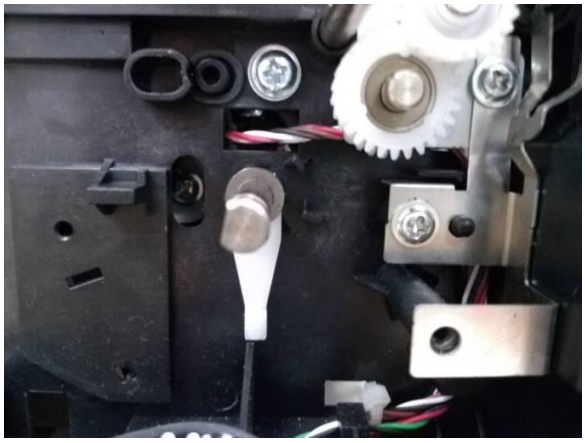
2. Remove the left cover.
3. Remove 3 screws to separate segment gear [A] and bypass solenoid A'ssy.



4. Remove the driving gear A'ssy.
5. Remove the feeding E-clutch [B].



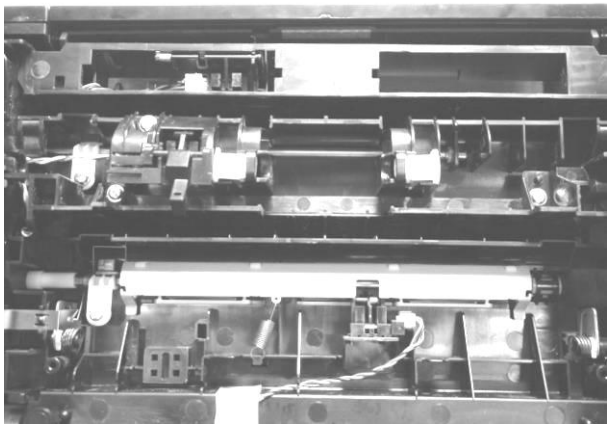
6. Turn the bushing fixing the pickup shaft on the main body to remove.



7. Press the frame on the left of the pickup roller to remove the bushing and remove the pickup roller.

Paper Detection Sensor (A610DN)

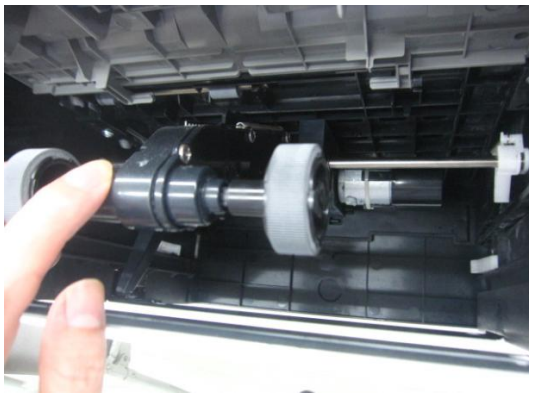
1. Separate the feeder and remove one screw at the bottom of the machine to remove it.



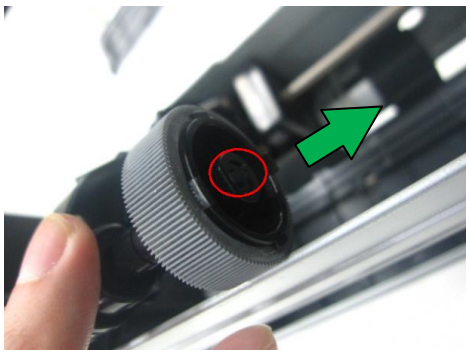
Separating the Main Feeding Roller (A611DN)

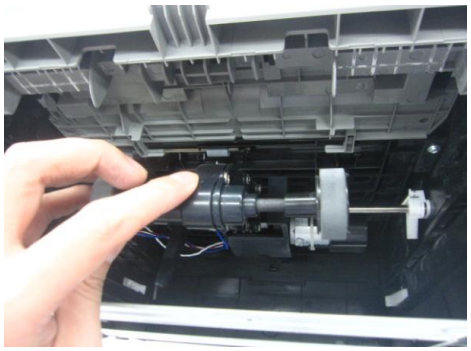
1. Pull the tray.

2. Press Accufeed A'ssy.



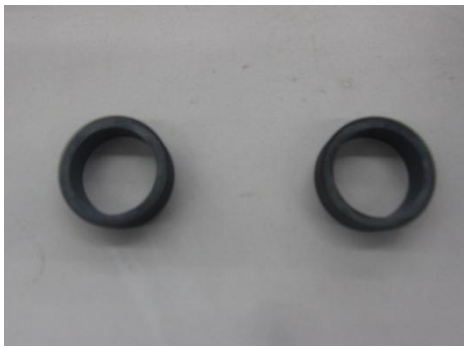
3. Press left and right hooks and remove the feeding roller A'ssy.





4. Pickup roller A'ssy removed

5. Pickup tire removed



Multipurpose Tray (MPT)

1. Open the front door and disconnect the link connected with the machine.
2. Push the front door to the left to remove it from the machine.

3. Remove 2 screws to separate door open shaft.

4. Separate MPT from the front door groove.

Replacing Base Body Ass'y Friction Pad in MPT

1. Open the front door and remove 2 screws.
2. Separate the harness connected to the left paper detection sensor.

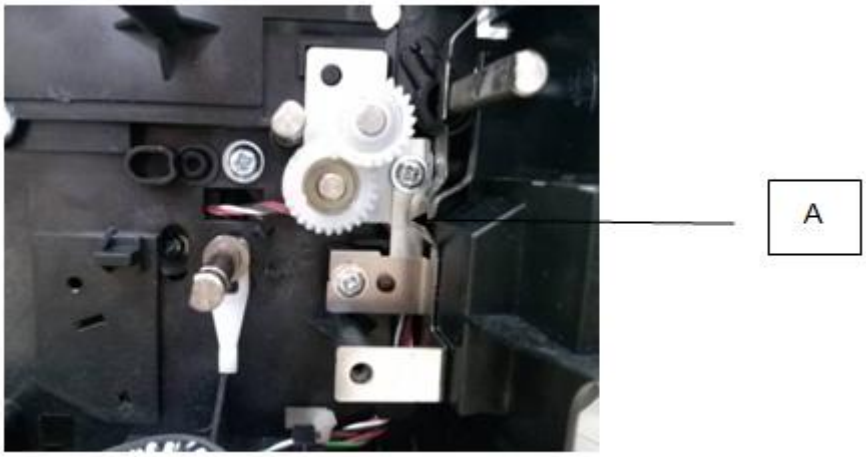
3. Separate MPT's bottom body A'ssy to replace friction pad A'ssy.

Removing the MPT Paper Detection Sensor

1. Separate MPT's bottom body A'ssy.
2. Remove the hook on the side of friction pad to remove MPT paper detection sensor.

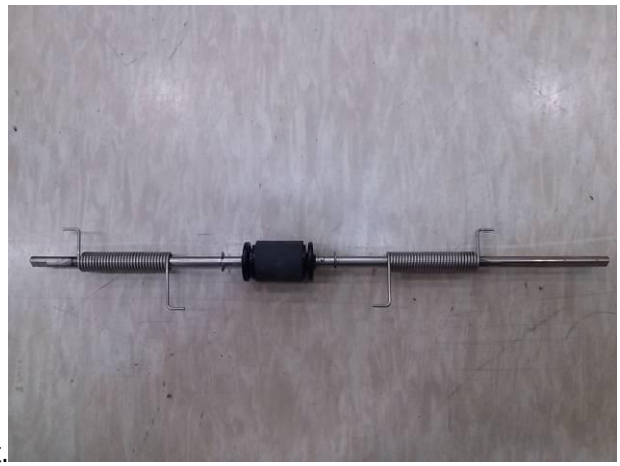
Removing Top Body Ass'y of Pick Roll

1. Remove the front door.
2. Remove the segment gear and clutch A'ssy.
3. Remove the metal clamp [A] contacting with pick roll shaft.



4. Remove the bush holding pickup roll shaft to the right 12 o'clock direction and remove it.

5. Separate the top body A'ssy while pushing to the left. Separate the pick roll shaft installed on top of body A'ssy groove.

6. Remove both caps on shaft ends and paper top guide and E-ring to separate arm from the shaft. 

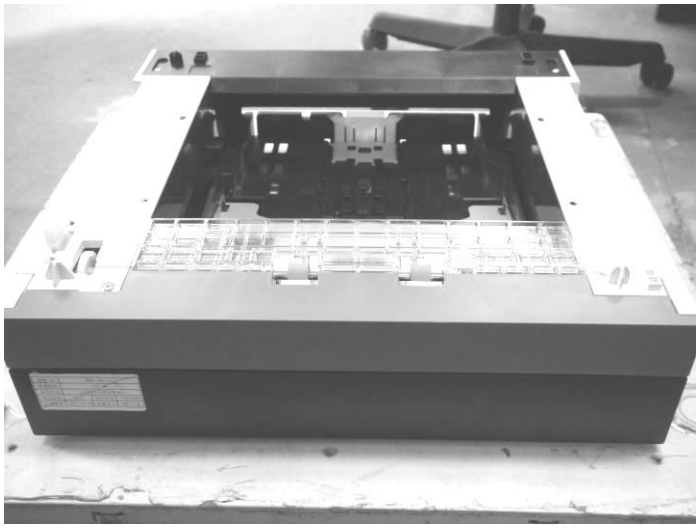
7. You can remove and replace the pickup roller and idle roller.

Removing the Optional Tray Unit Cover (A610DN)

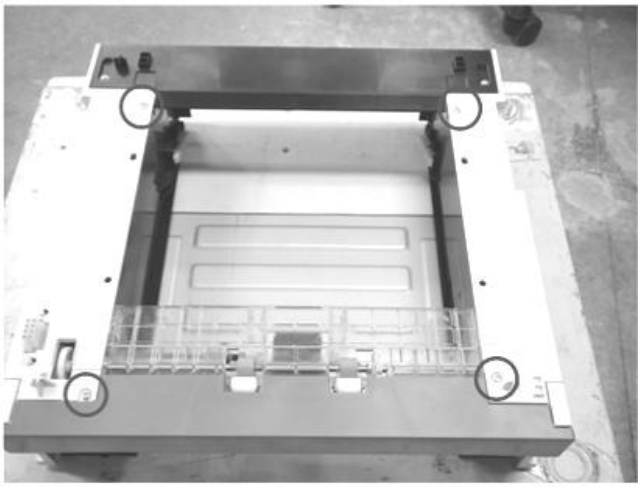
1. Take the tray cassette out and separate feeding unit from the machine.

⚠CAUTION

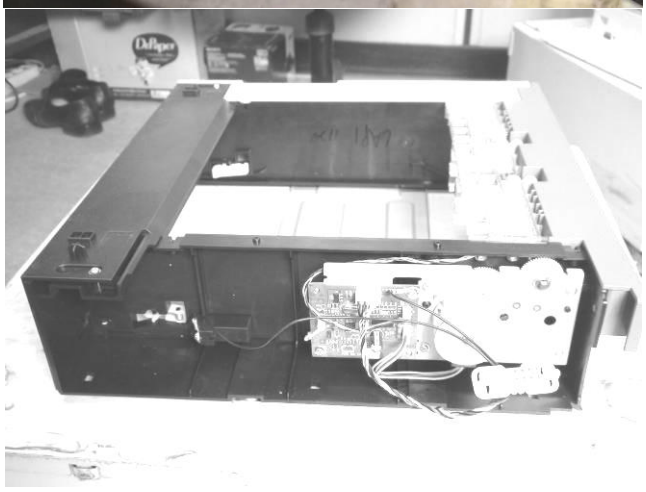
Before removing the tray unit from the machine, the machine's power must be turned off.



2. Separate the tray unit and remove 4 screws.



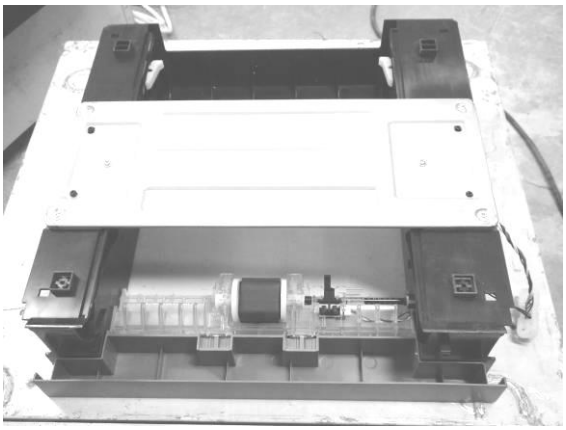
3. Separate the connector to remove the left cover. Be careful not to damage the hook inside of top left cover.



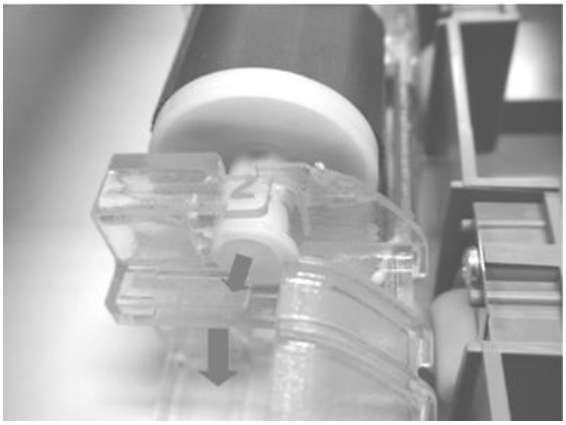
4. Separate right cover. Be careful not to damage the hook inside of top right cover.

Removing the Optional Tray Pickup Roller (A610DN)

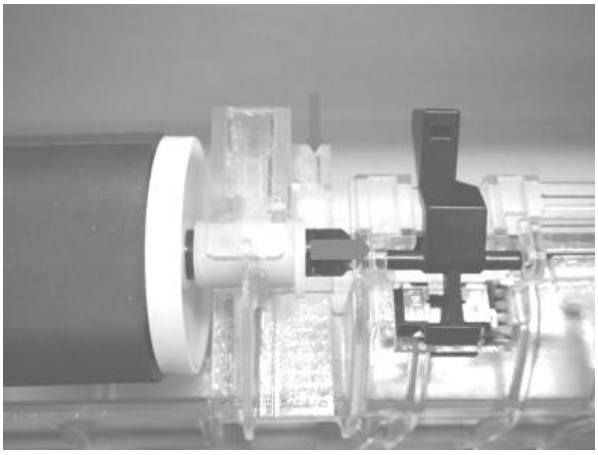
1. Flip the tray.



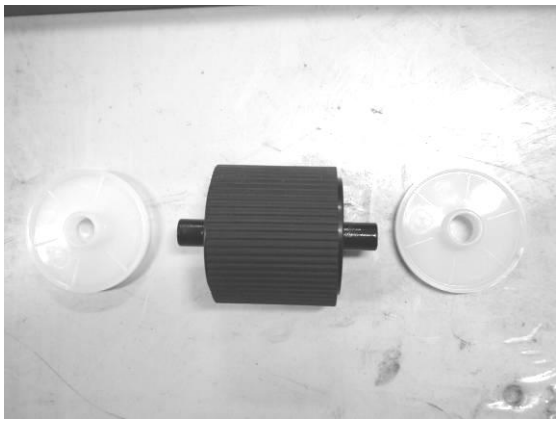
2. Push down the plastic preventing bush separation and remove the bushing.



3. Remove the bushing on the other side the same way.

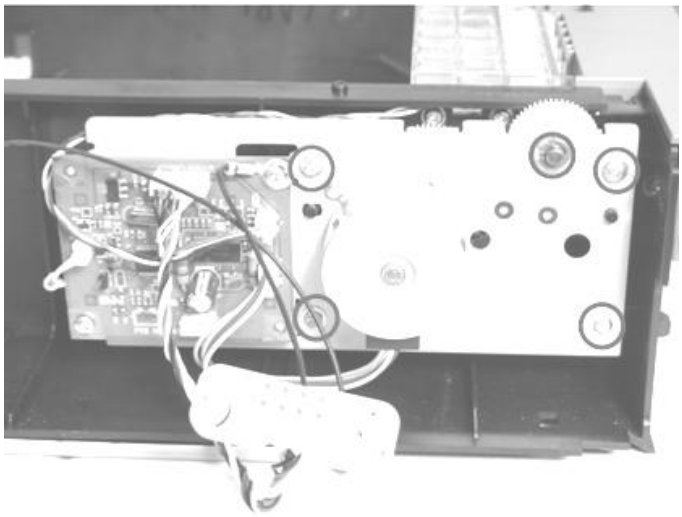


4. Disassembled pickup roller

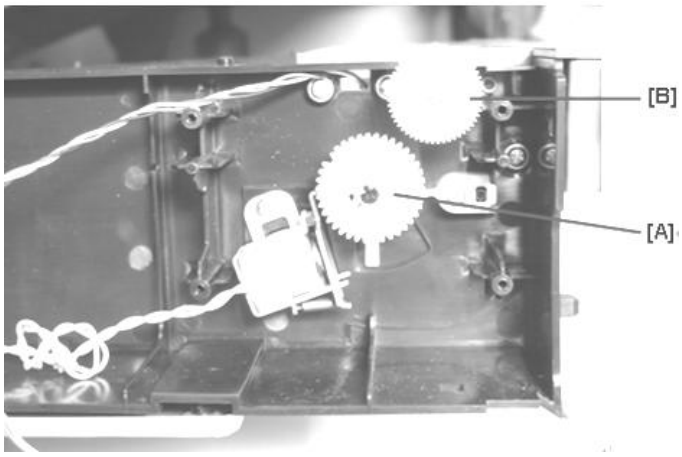


Removing Optional Tray Feeding Roller (A610DN)

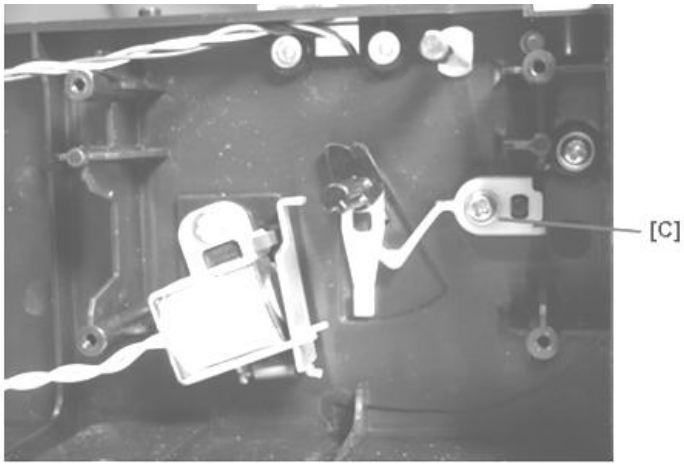
1. Remove one E-ring and 4 screws to separate left board and motor mounted bracket.



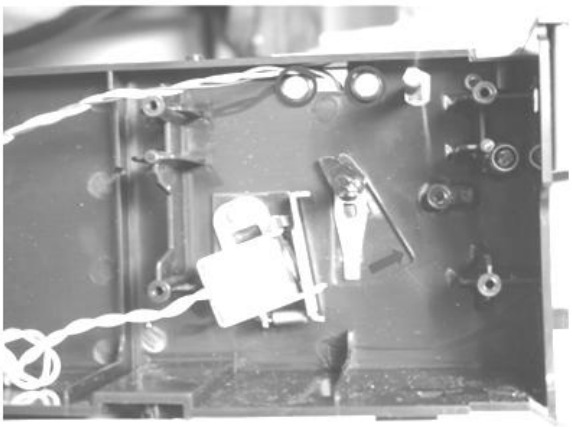
2. Remove the segment gear [A] and gear [B].



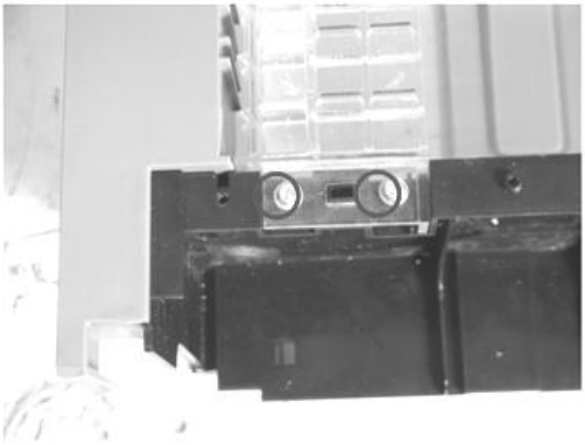
3. Remove one screw to remove pickup shaft holder [C].



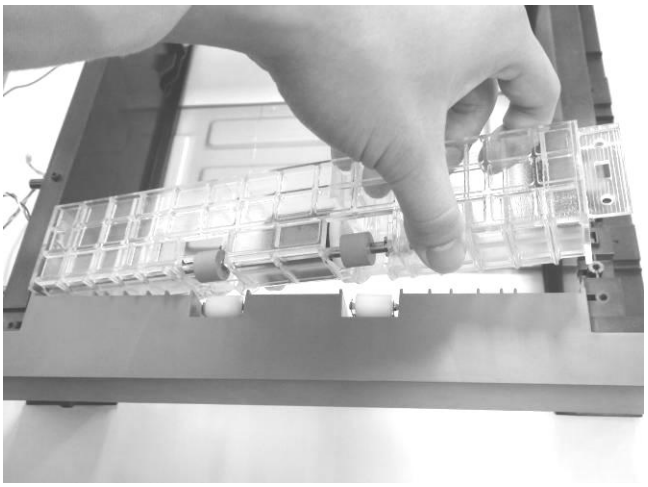
4. Rotate the pickup shaft bushing to right to remove pickup shaft and 2 screws.

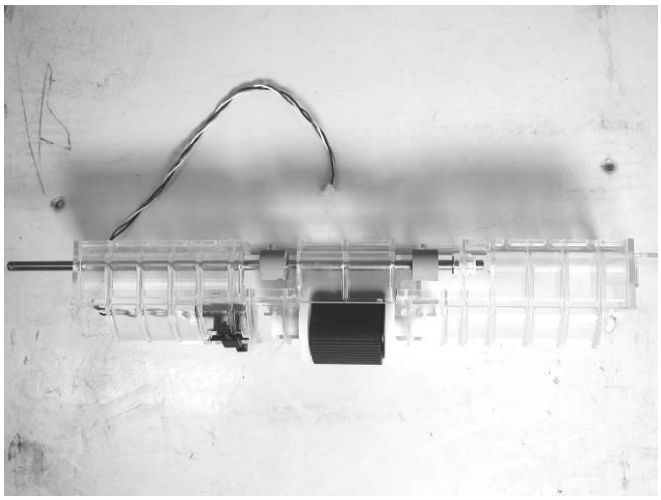


5. Remove 2 screws on the top right of pickup A’ssy.

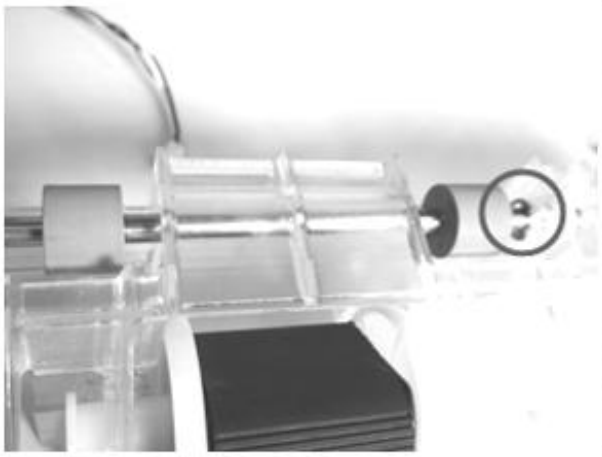


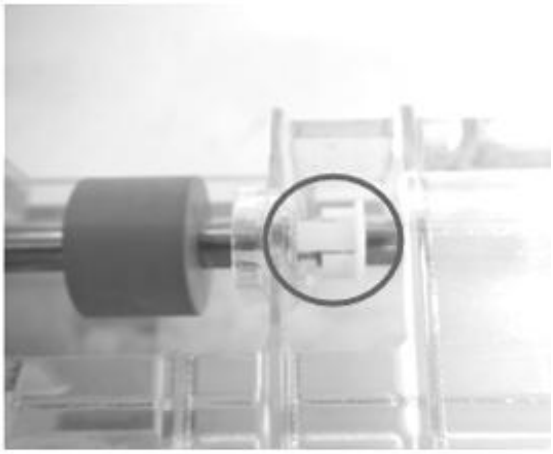
6. Separate the pickup A’ssy. Lift the right side to remove harness through the frame hole

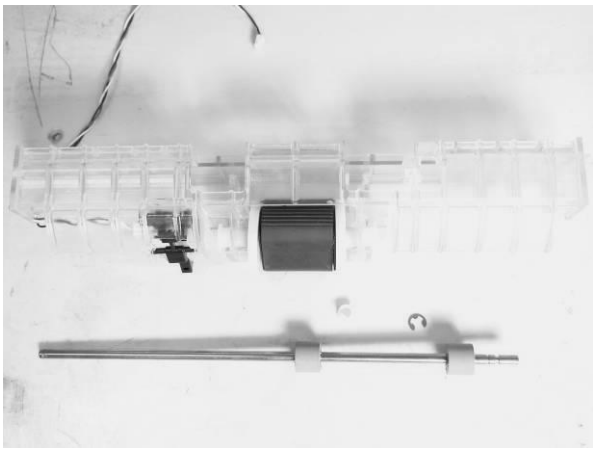




7. Remove E-ring and bushing to remove feeding roller shaft.





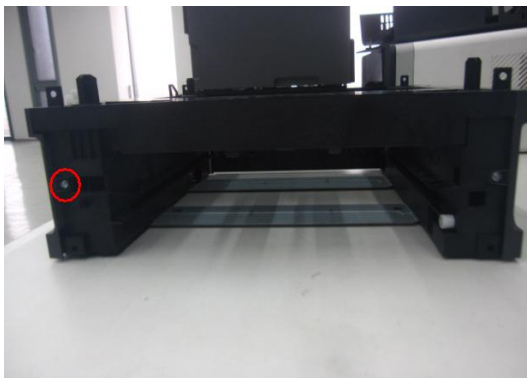


Removing the Optional Feeding Unit Cover (A611DN)

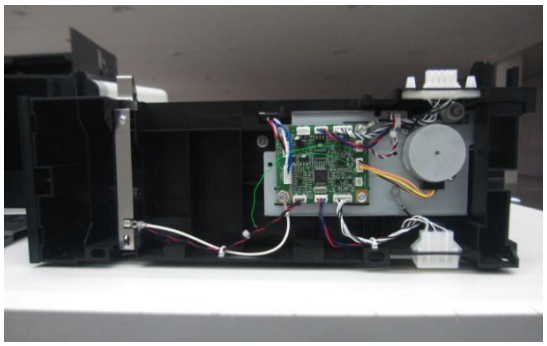
1. Remove the tray cassette and remove the feeding unit from the main body.

   Turn off the power of the machine before removing the feeding unit from the main body.

2. Remove the tray and remove 1 screw.



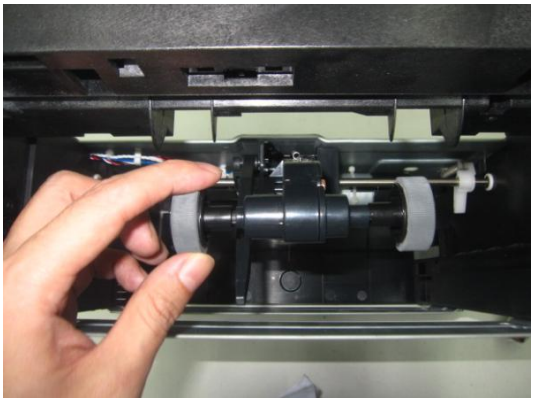
3. Separate the left cover.



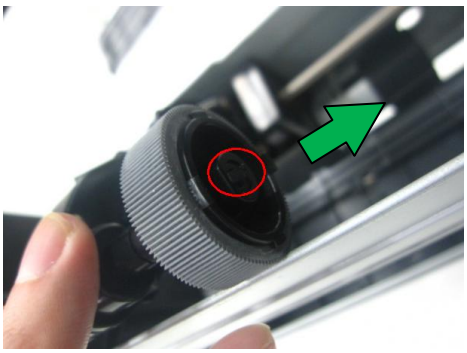
Removing the Optional Tray Pickup Roller (A611DN)

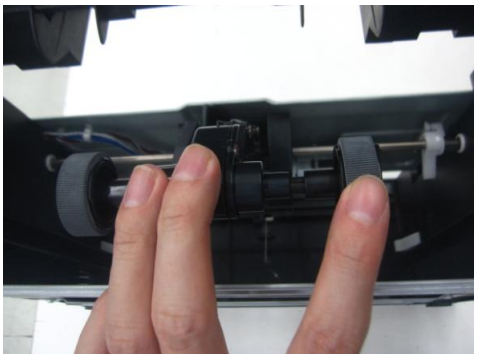
1. Pull out the tray.

2. Press Accufeed A’ssy.



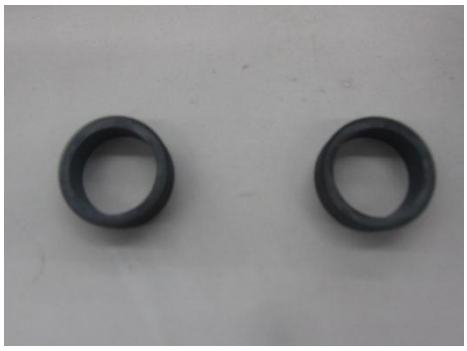
3. Press left and right hooks and remove the feeding roller A’ssy.





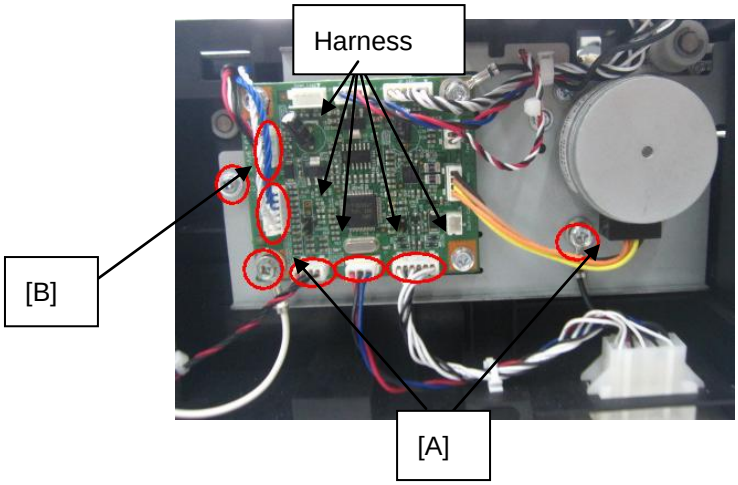
4. Disassembled pickup roller A’ssy.

5. Disassembled Pickup Tire

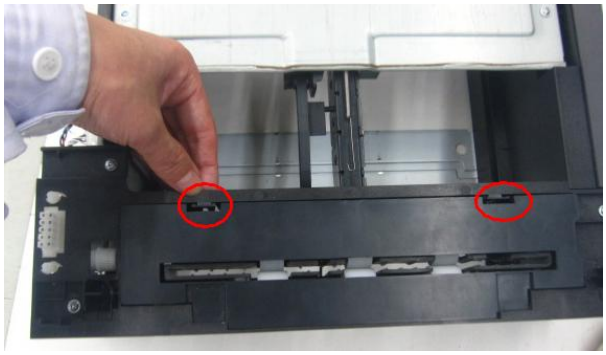


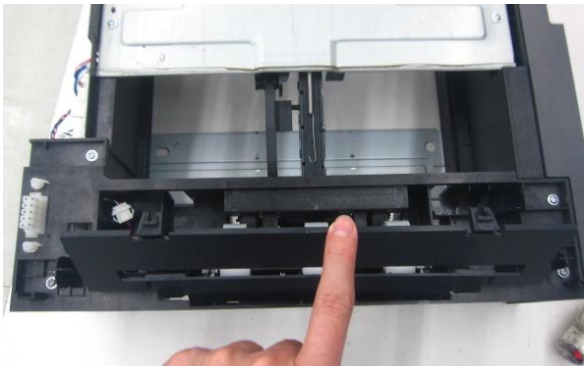
Removing the Optional Tray Return Unit (A611DN)

1. Remove 5 harnesses and unscrew [A] and [B].

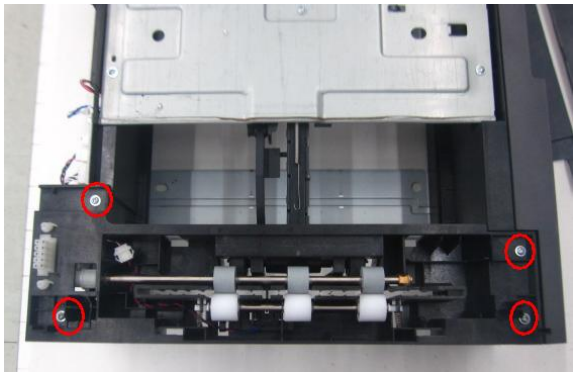


2. Press the 2 hooks on the top cover and remove the top cover.

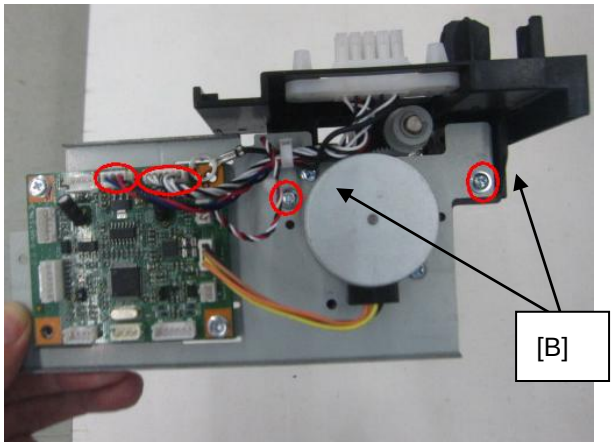




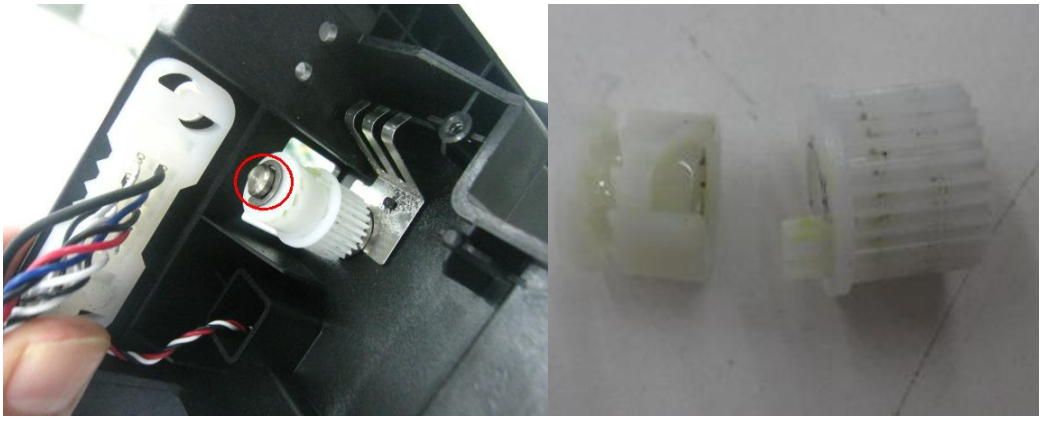
3. Remove 4 screws [B] and separate the transport unit.



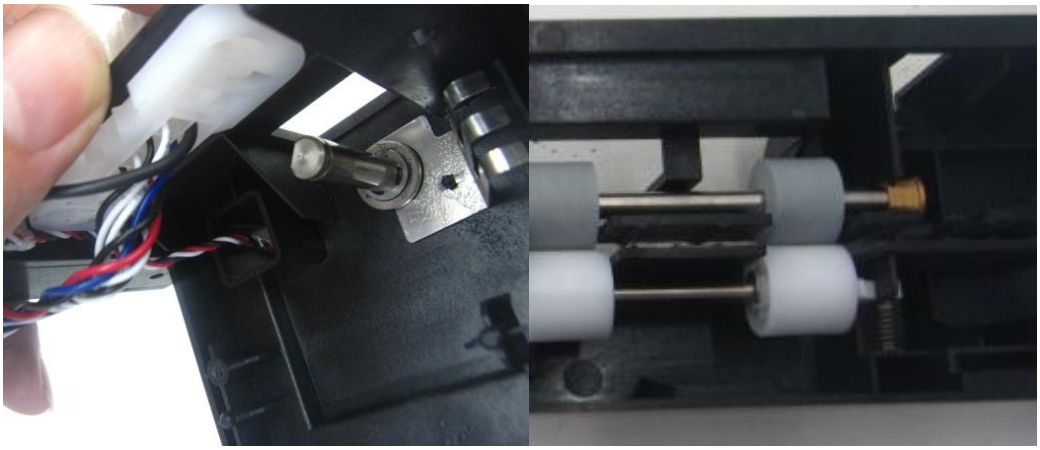
4. Remove the 2 harnesses on the separated transport unit, remove 2 screws [B] and remove the driving A'ssy.

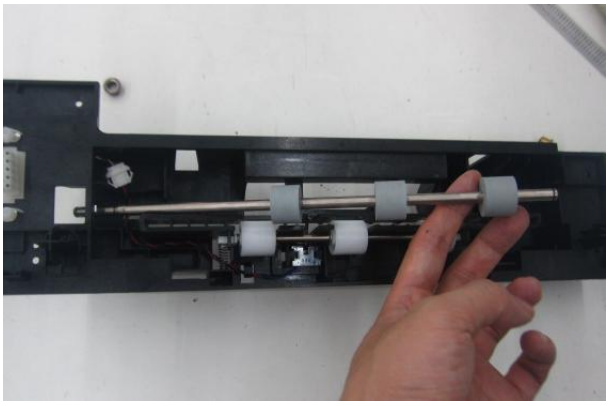


5. Hold the E-ring on the pickup shaft's right and remove the one way clutch.



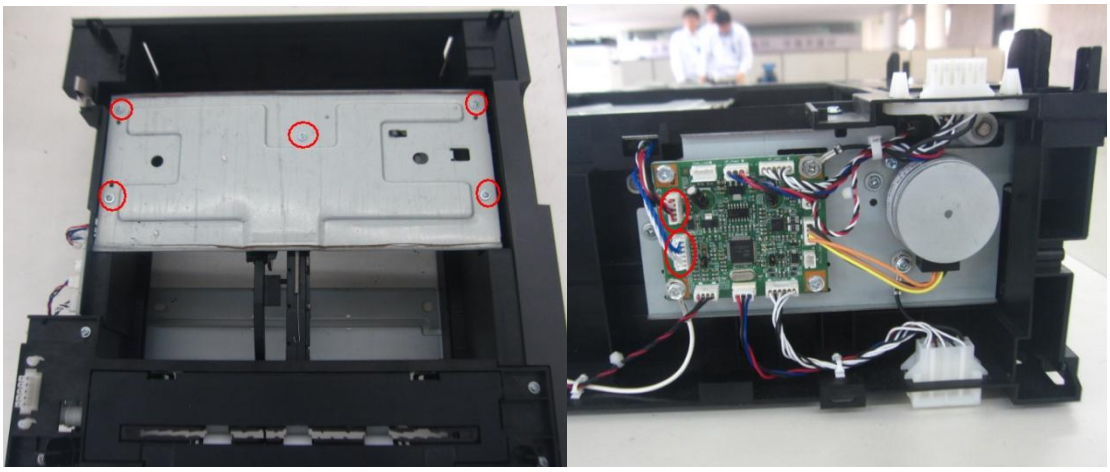
6. Remove the E-Ring and bushing and separate the feeding roller shaft.



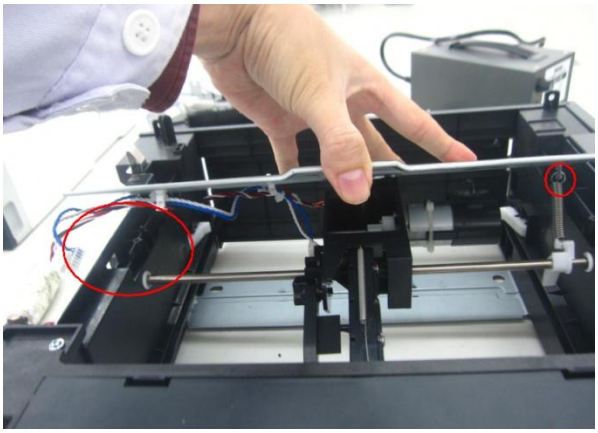


Removing the Optional Accufeed Unit (A611DN)

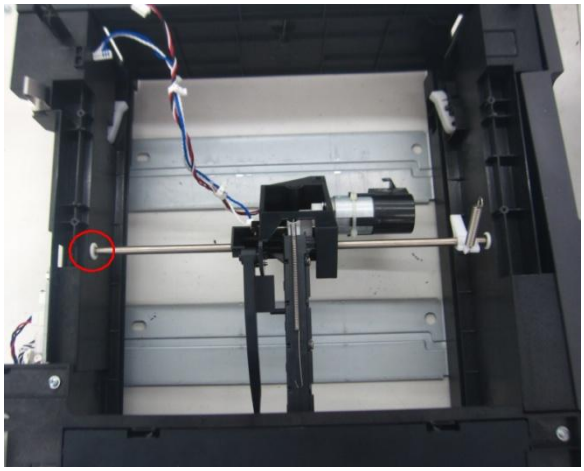
1. Remove 2 harnesses and remove 5 screws [A].



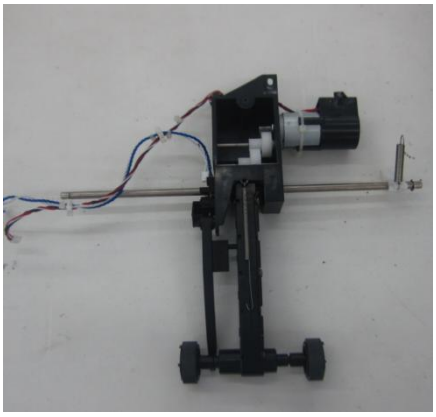
2. Remove from the hole in the hook Accufeed BKT on the motor cover and remove the Accufeed BKT. Handle the harness and spring carefully when separating.



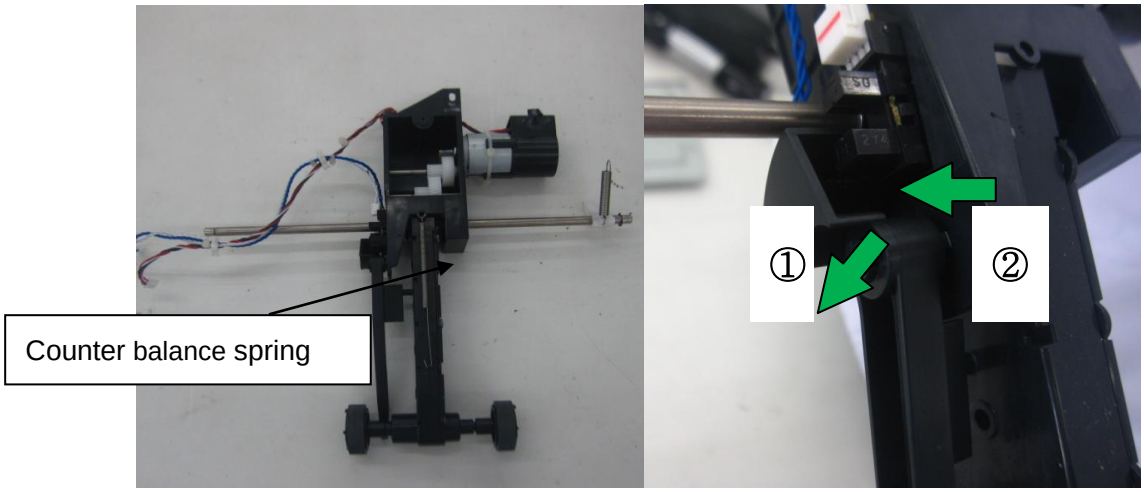
3. Remove the E-ring on the left of the Accufeed shaft and remove the Accufeed A'ssy.



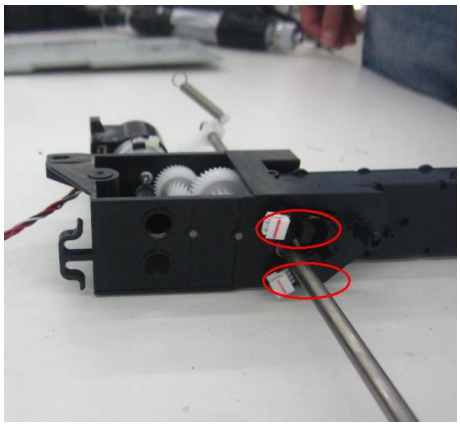
4. Removed Accufeed A'ssy



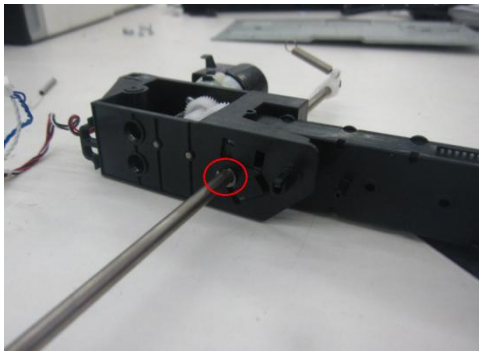
5. Remove the counter balance springs from the 7 holes from the Accufeed starting at the front. Press the hook on the auto comp and remove the feeder.



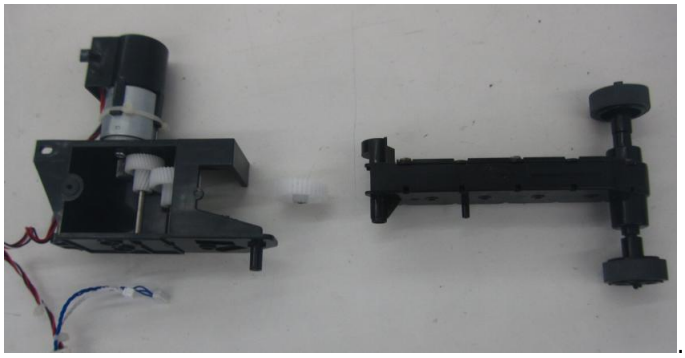
6, Remove the Accufeed unit and paper detection sensor from which the harness has been removed.



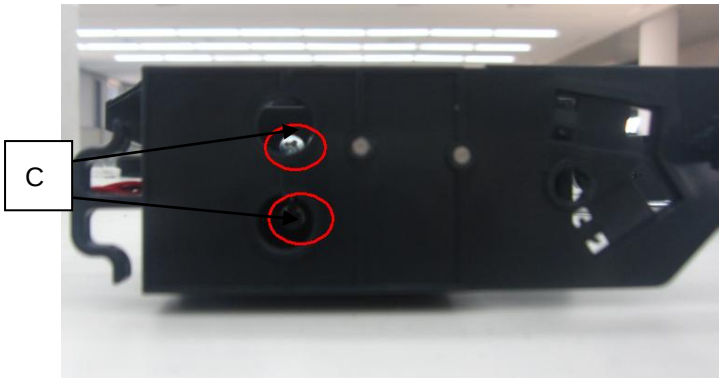
7. Remove the E-ring on the left and remove the shaft.



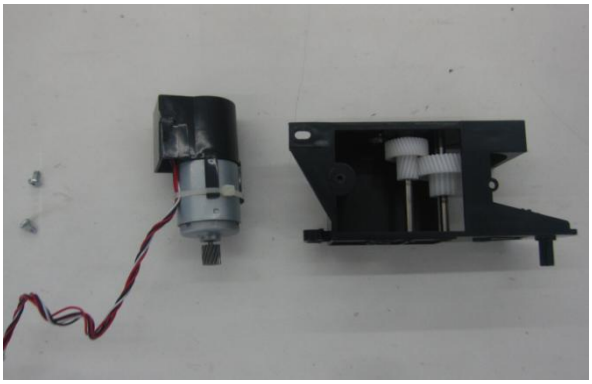
7. Auto comp and arm A'ssy disassembled from shaft



8. Remove 2 screws [C] and separate the motor.

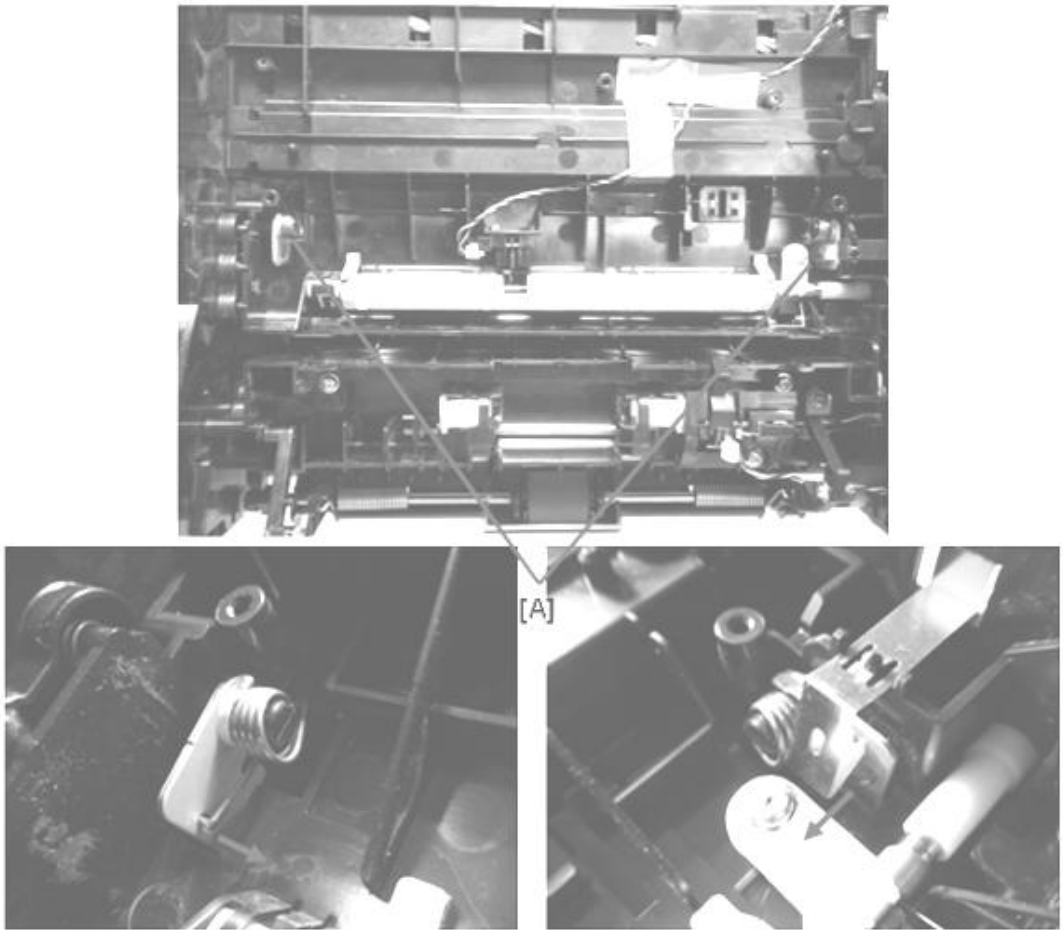


9. Separated auto comp and motor

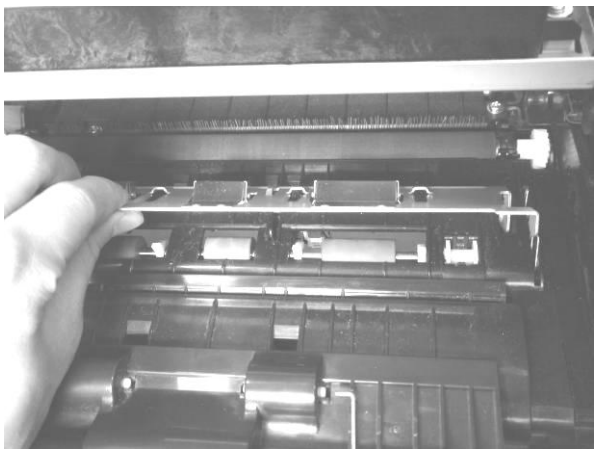


Resist Guide A’ssy

1. Disconnect 2 springs [A] connected to the resist guide A’ssy at the bottom of the machine.

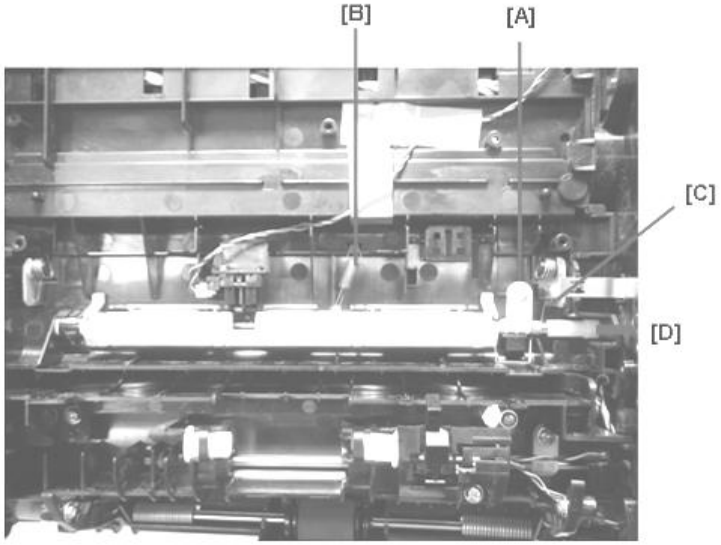


2. Tilt the resist guide A’ssy 60° and pull forward to remove.

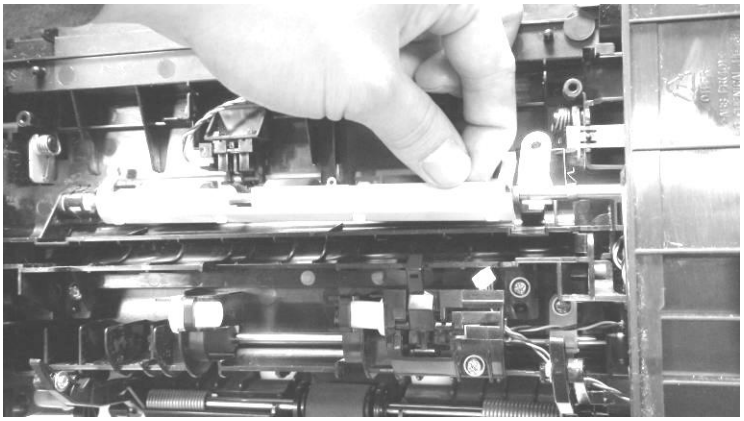


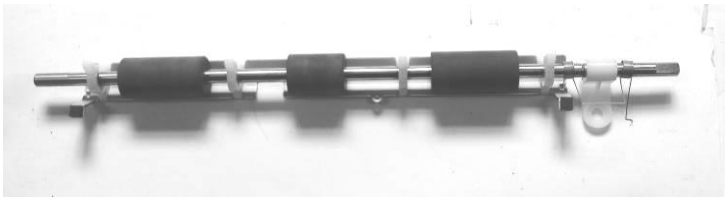
Removing the Resist Roller

1. Remove screw [A] and spring [B] from the bottom part of the machine and disconnect the spring [C].
2. Push the coupler [D] outward to remove.



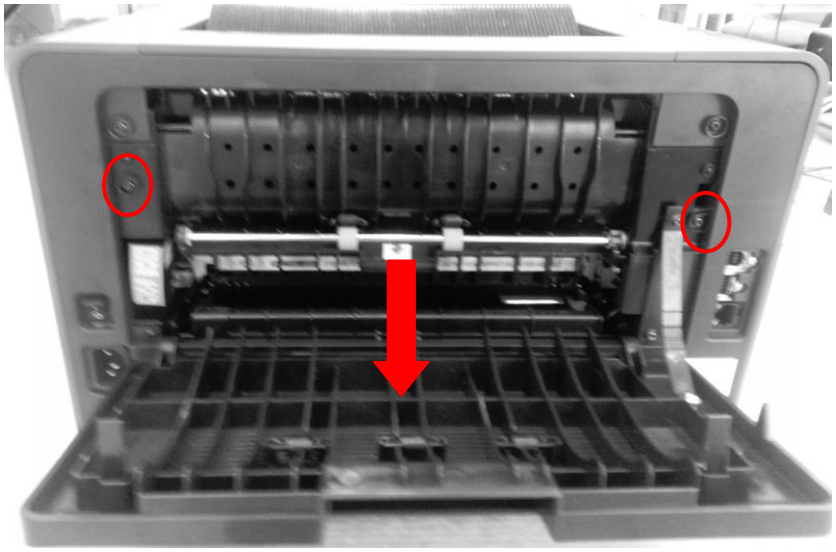
2. Hold and lift the cover from which the coupler has been removed and separate the resist roller A'ssy.



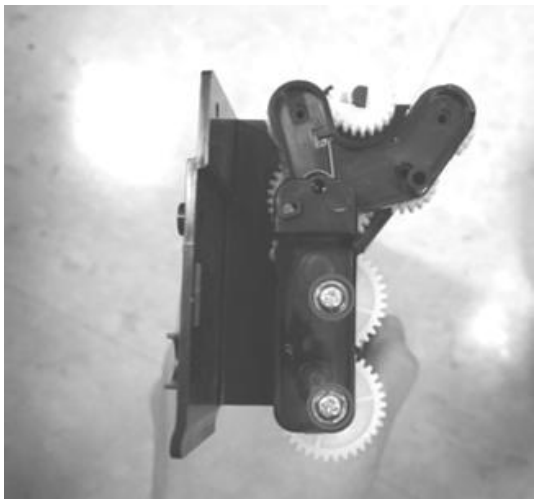


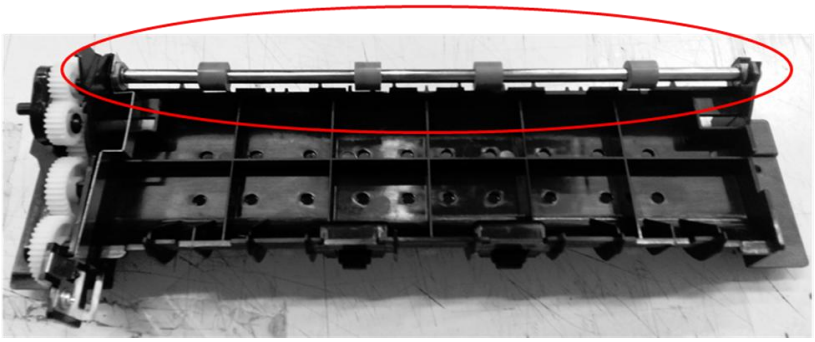
Output Unit

1. Remove the rear cover.
2. Remove the two screws fixing the output frame and press the fuser output guide down to separate the output frame.

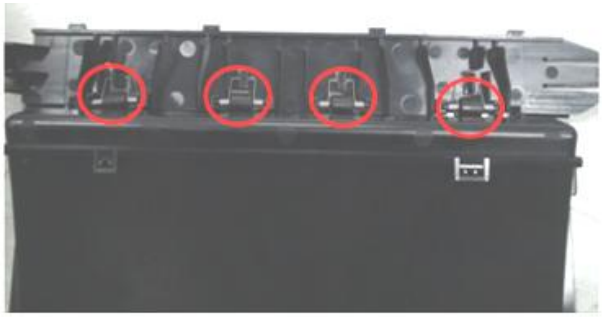


3. Remove 2 screws and replace the fuser driving gear. You can remove the output roller shaft.





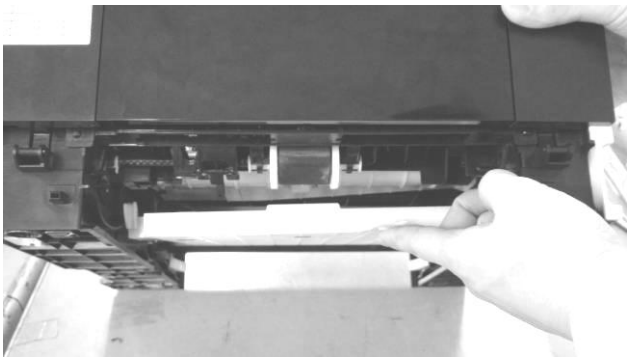
4. Remove the left and right covers.
5. Remove the top cover and replace the idle roller inside.



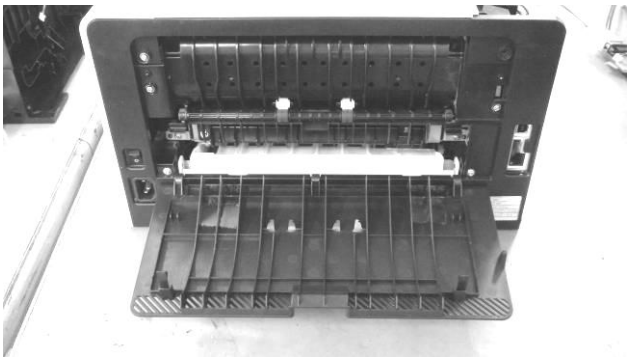
Duplex Unit (A610DN)

Removing the Duplex Unit

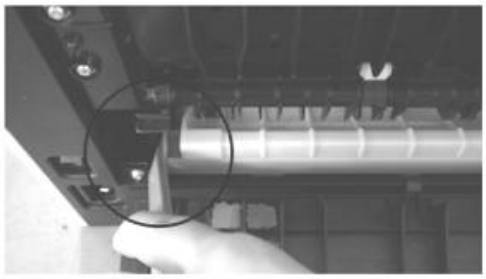
1. Remove the main and optional trays from the main body.
2. Press the base body of the duplex unit to remove.



3. Open rear cover.



4. Push the cover hook inside using a flat-head screwdriver to unlock the hook.

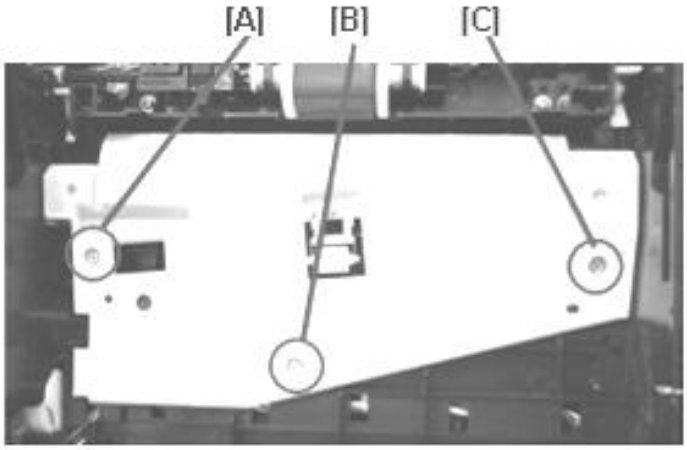


⚠CAUTION

Be careful not to damage the hook (1 hook on either side).

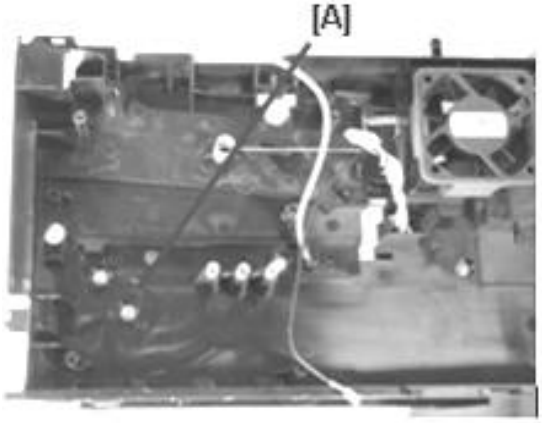
5. Tilt the machine upright and remove the base body of the duplex unit. When removing, press the unit to avoid being hooked by the cassette clip at the back of the machine.

6. Remove screws [A], [B], and [C] on the top body of the duplex unit and remove the top body.



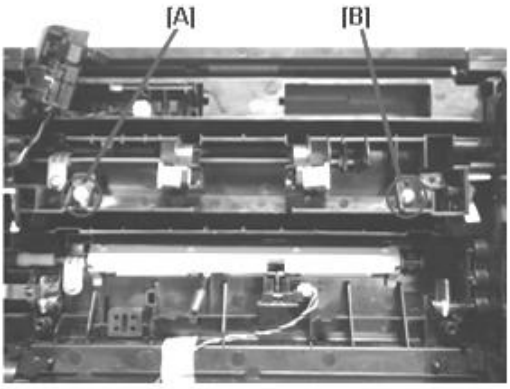
7. Remove the right cover.

8.Remove PDU and screw [A].

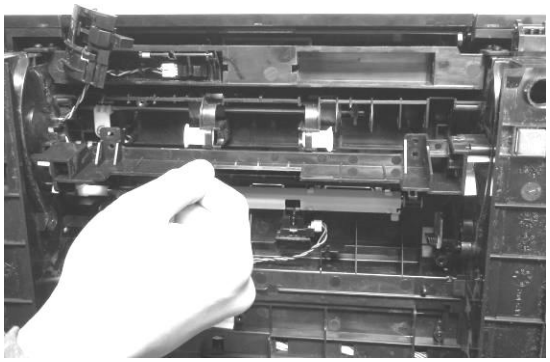


9. Remove the pickup roller A’ssy.

10. Remove screws [A] and [B] to remove the front guide of the duplex unit.



11. Tilt the front guide of the duplex unit after removing screws.



⚠CAUTION

To install the duplex, align the front body with the grooves in the frame.

12. Replace with a front body that does not have a white holder and install on the main body.

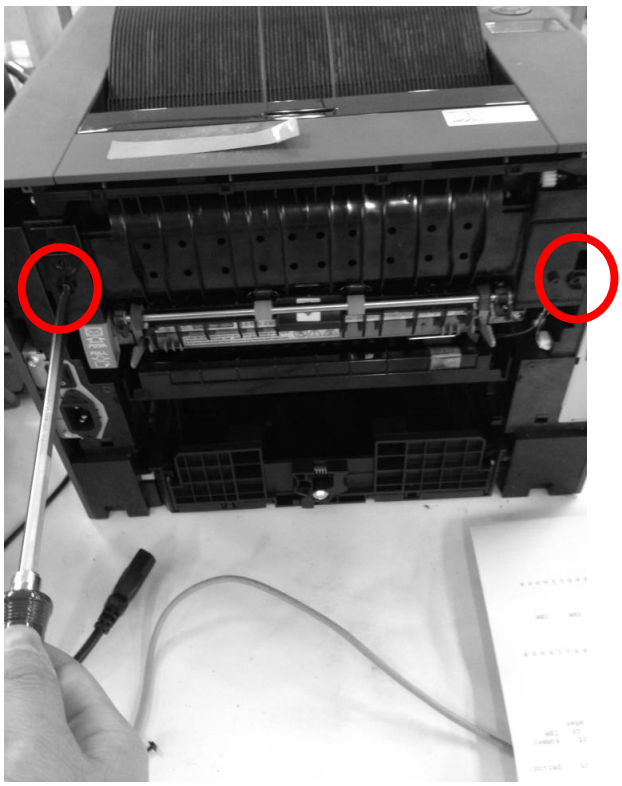
Reassemble in reverse order.

Duplex Unit (A611DN)

Removing the Duplex Unit

1. Turn off power and remove power and USB cables from device.
2. Remove main tray, IC and optional tray from the main body.
3. Open rear cover and loosen bolts to remove.

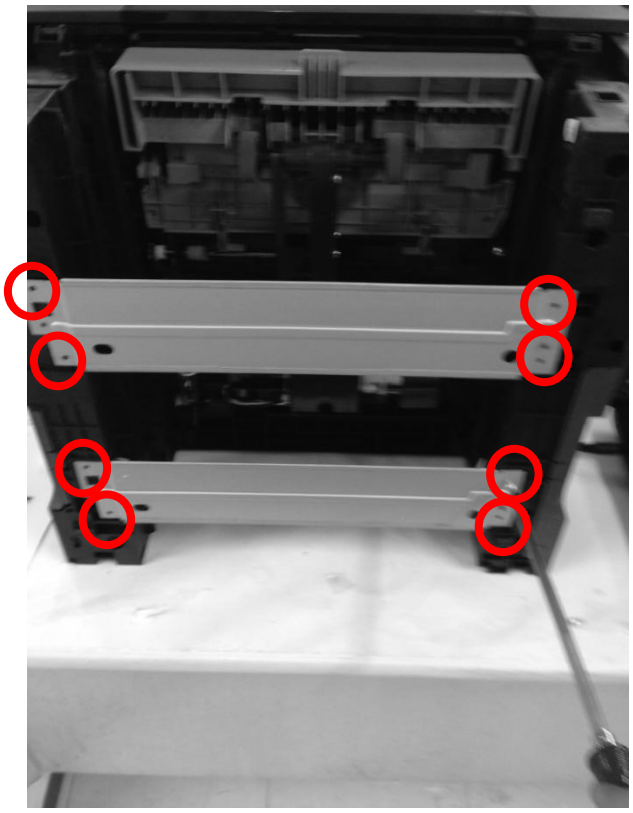
4. Loosen bolts on both sides and remove the exit frame.



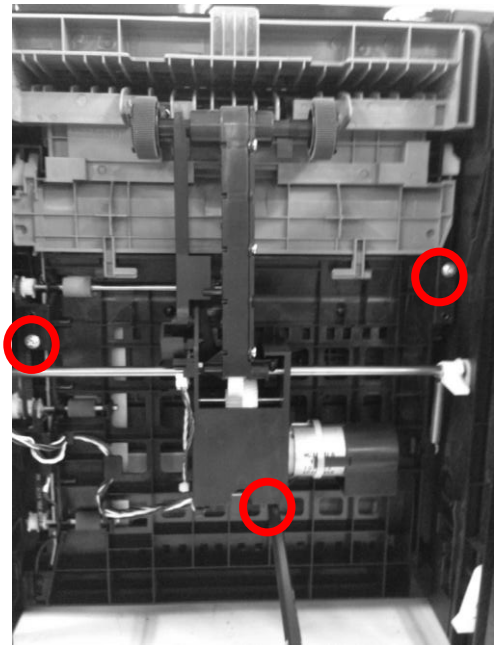
5. Undo the ground connecting harness bolt in the fuser frame.

⚠CAUTION

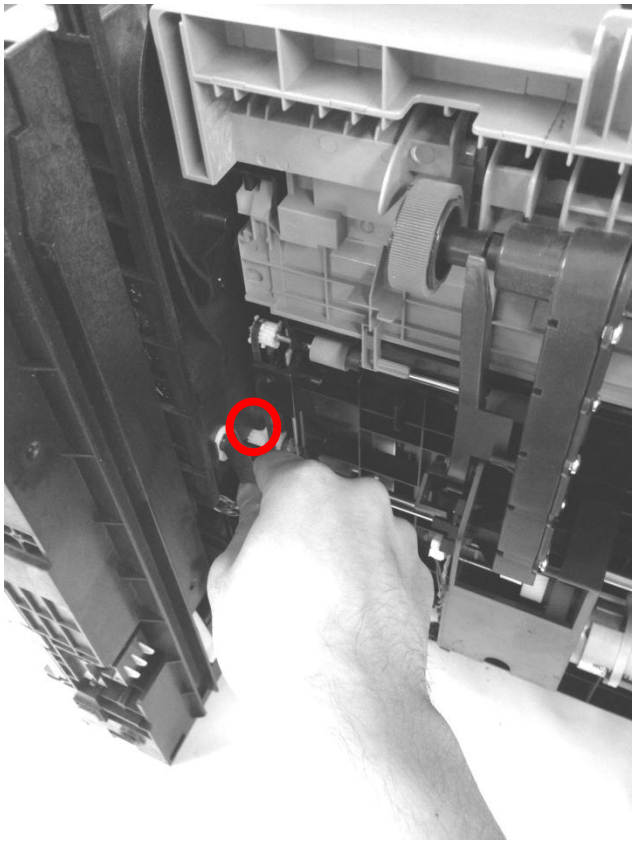
6. Stand machine on its side and remove 2 frame-fixing Press BKT (4 bolts each).



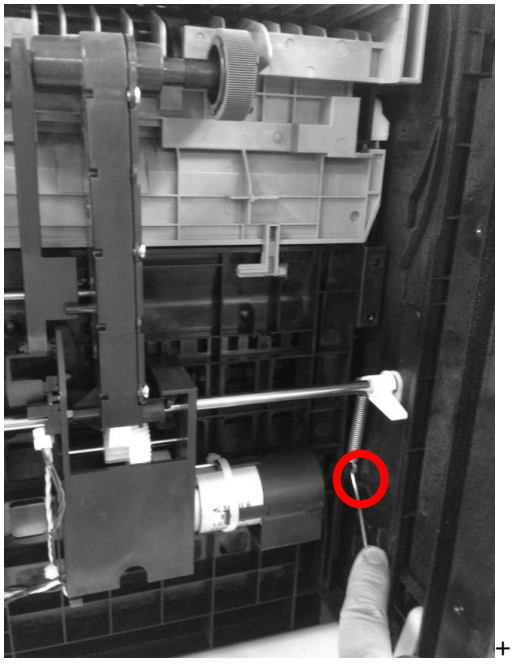
7. Remove 3 bolts fixing the Accufeed unit and base BKT.



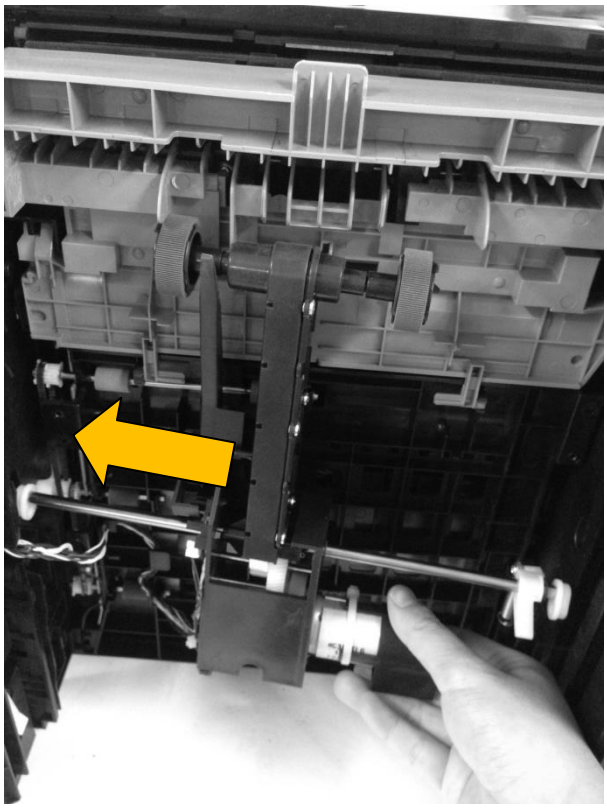
8. Remove the E-ring holding the shaft.



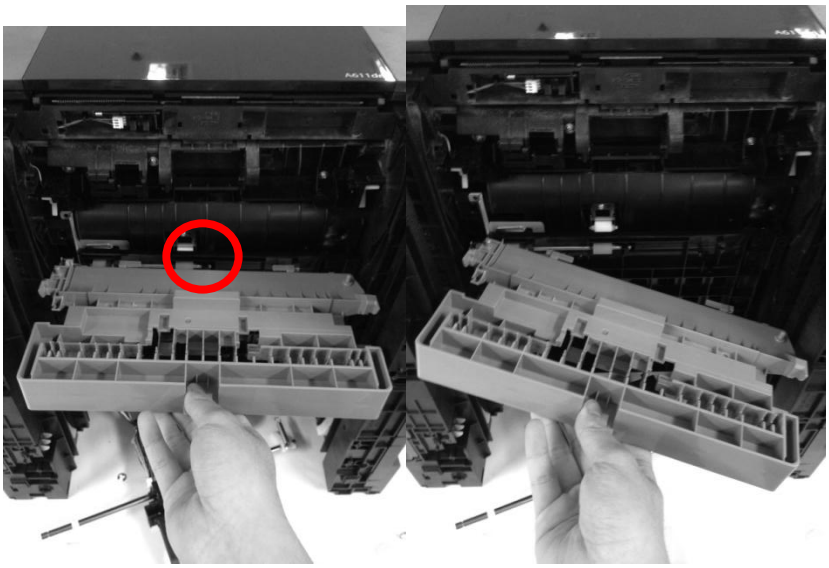
9. Remove Accufeed spring. (Use sharp tool)



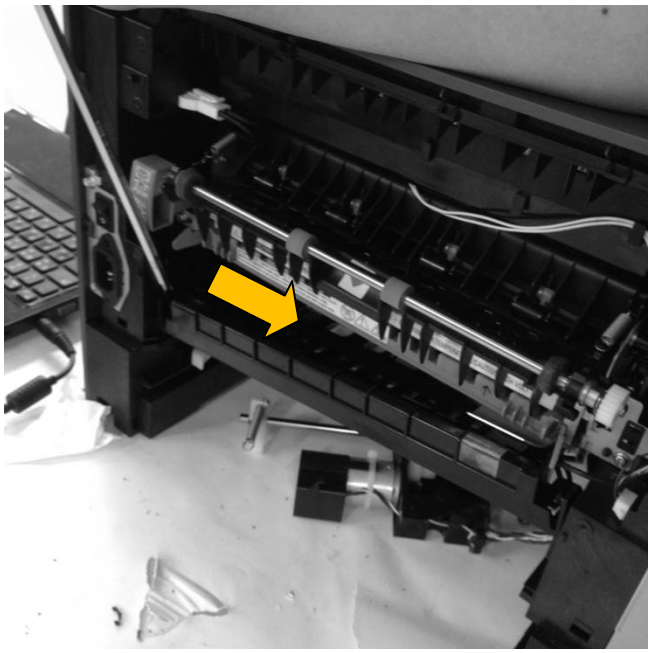
10. Push the Accufeed unit to the left to remove.



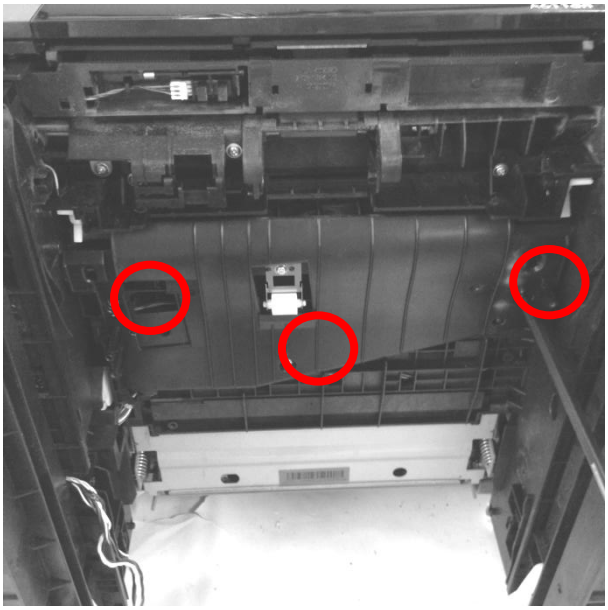
11. Stand the jam removal cover horizontally and remove the right hinge first.



12. Place the device in the right position. Insert a screwdriver into the left of the base bracket (seen from the rear). Push (-) driver in and remove.



13. Stand device on its side again and loosen the bolts fixing the upper BKT and EP frame.



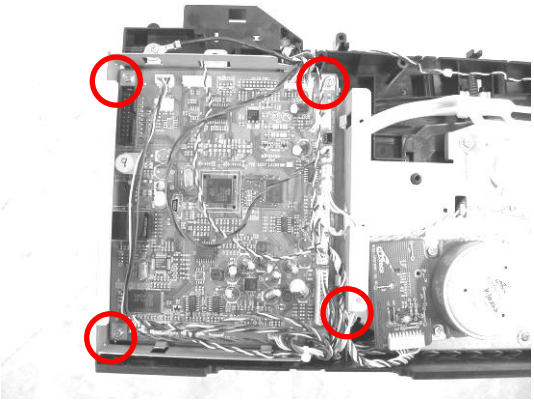
⚠CAUTION

Reinstall the duplex unit in reverse order.

Front Part

Main Board

1. Remove the rear cover of the machine.
2. Open the front door and remove the left cover.



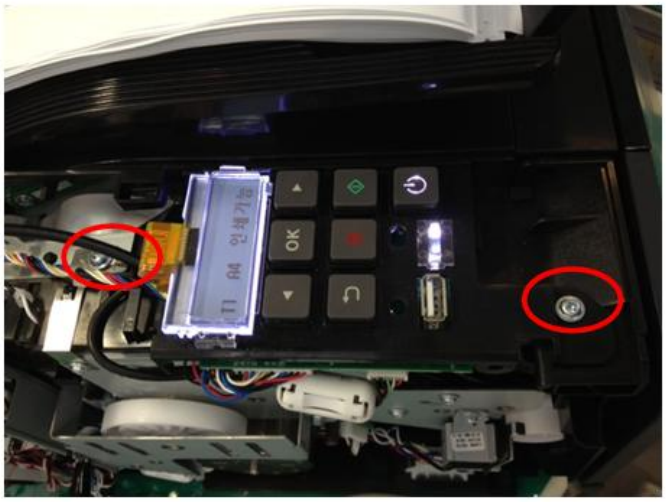
3. Separate 15 harnesses from the connector and 4 bolts and the main board.

⚠CAUTION

- Be careful not to disconnect harness wires when removing the harness from the connector.
- When disassemble, take caution on paths to use it on re-assemble.

OPU

1. Remove the rear cover and open the front cover.
2. Remove the left cover.



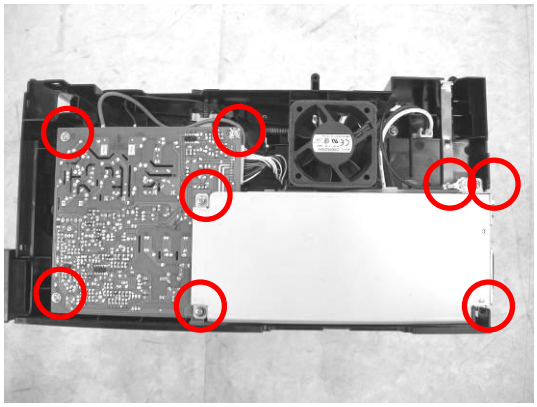
3. Remove 2 bolts at the top and bottom of Control Panel and the harness and core connected to the CN1 and 2 connectors in OPU. Remove the control panel from the frame.

⚠CAUTION

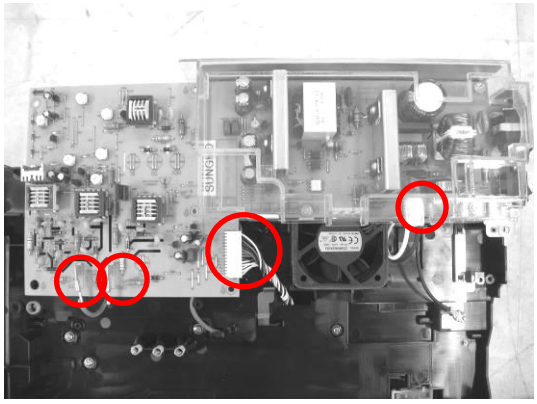
- Be careful not to disconnect harness wires when removing the harness from the connector.
- Be careful not to damage flat harness on control panel.
- Refer to the harness path to main board to reassemble.
- When disassembling OPU, make sure not to lose LED indicator below the button.
-

PDU

1. Remove the rear cover and open the front cover.
2. Remove the right cover.



3. Remove 8 bolts.



4. Separate 4 harnesses from the connector and remove PDU board.

⚠CAUTION

- Be careful not to disconnect harness wires when removing the harness from the

connector.

- When reassemble, take caution not to have the harness to get caught on the right cover hook.

Troubleshooting

Error Messages and Error Codes (A610DN)

Service Error Codes

Generally, it is not possible to recover when service error code is displayed, but temporary errors may disappear when POR the printer.

Service Error Code (3xx)

Error	Description	Action
300	Fuser under temperature while printing	Occurs when Fusing temperature is lower than the set temperature for more than 10 seconds while printing 1. Check the harness between Fusing and power unit 2. If the problem is not solved, replace the Fusing unit
301	Fuser under temperature while at standby	OccursOccurs when Fusing temperature is lower than the set temperature for more than 10 seconds during stand by 1. Check the harness between Fusing and power unit 2. If the problem is not solved, replace the Fusing unit
302	Fuser failed to reach standby temperature	OccursOccurswhen Fusing temperature does not reach stand-by temperature within 60 seconds after POR 1. Check the harness between Fusing and power unit 2. Check the harness between system card and thermistor 3. If the problem is not solved, replace the Fusing unit
303	Fuser over temperature	OccursOccurswhen Fusing temperature goes over 230 degrees 1. Check the harness between Fusing and power unit 2. If the problem is not solved, replace the Fusing unit

304	Fuser thermistor failure	OccursOccurswhen Fusing temperature does not go over 35 degrees within 10 seconds after POR 1. Check the harness between Fusing and power unit 2. Check the harness between system card and thermistor 3. If the problem is not solved, replace the Fusing unit
310	Print head lost Hsync	OccursOccurswhen printer head cannot detect Hsync properly 1. Check the harness between system card and printer head 2. If the problem is not solved, replace the print head
311	Mirror motor lock failure	OccursOccurswhen print head's internal mirror motor does not reach target speed within the configured time 1. Check the harness between system card and printer head 2. If the problem is not solved, replace the print head
320	Main motor lock failure	OccursOccurswhen driving motor does not reach target speed within the configured time 1. Check the harness between system card and driving motor unit 2. If the problem is not solved, replace the driving motor unit
330	Fan motor lock failure	OccursOccurswhen fan motor does not reach target speed within the configured time 1. Check the harness between system card and fan unit 2. If the problem is not solved, replace the fan unit
340	Option Tray Lost link Error	OccursOccurswhen there's a communication problem between option tray 1. Check the harness between system card and option tray 2. If the problem is not solved, replace the option tray board
390	Engine Software Error	OccursOccurswhen a problem that cannot be recovered from engine software 1. Check the problem reoccurrence after POR 2. If the problem reappears, replace the system card

Service Error Code (5xx)

Error	Description	Action
501	OPL Parsing Error	OccursOccurswhen a problem occurs during OPL parsing (sentence analyzing) 1. Check if correct printer driver is installed 2. Check if recommended USB cable is being used 3. Replace the system card
502	PJL Parsing Error	OccursOccurswhen a problem occurs during PJL parsing 1. Check if correct printer driver is installed

		2. Check if recommended USB cable is being used 3. Replace the system card
503	Software Error Module 1	Software Error Module 1 1. Check reoccurrence after POR 2. Replace the system card
504	Software Error Module 1	Software Error Module 2 1. Check reoccurrence after POR 2. Replace the system card
505	Software Error Module 1	Software Error Module 3 1. Check reoccurrence after POR 2. Replace the system card
506	Software Error Module 1	Software Error Module 4 1. Check reoccurrence after POR 2. Replace the system card
507	Software Error Module 1	Software Error Module 5 1. Check reoccurrence after POR 2. Replace the system card

Service Error Code (2xx)

Error	Description	Action
201	Insufficient Memory	Occurs when allocated memory is insufficient 1. Check reoccurrence after POR 2. Replace the system card
202	Memory Full	Occurs when memory is full 1. Check reoccurrence after POR 2. Replace the system card
211	Defective Flash	Occurs when flash drive cannot be recognized 1. Check reoccurrence after POR 2. Replace the system card
212	Too Many Bad Block	Occurs when there are too many bad blocks in flash partition 1. Check reoccurrence after POR 2. Replace the system card
213	Flash Full	Occurs when flash is full 1. Format the flash 2. Close some stand-by tasks
221	Boot Argument Read Failure	Occurs when necessary arguments when booting 1. Check reoccurrence after POR 2. Replace the system card
251	USB Device Open Failure	Occurs when USB device cannot be used 1. Check reoccurrence after POR 2. Replace the system card

User Interactive Messages and Paper Jam Message

Paper jam and paper jam messages occur with the following reasons.

- Bad pickup solenoid or solenoid cam abrasion
- Flag and spring defect

- Standard guide backup roller abrasion
- Inappropriately adjusted standard guide
- Obstacles in paper path
- Different paper length than the length assigned from driver

User Interactive Messages & Paper Jam Messages (1xx)

Message	Description
110 Cartridge Certification failure	Occurs when cartridge recognition fails or when cartridge is not installed 1. Reinstall the cartridge and check if it reoccurs 2. Check the contact between Smart IC installed in cartridge and system card 3. Replace the cartridge
111 Cartridge Over run failure	Occurs when cartridge capacity is exceeded 1. Replace the cartridge
112 Cartridge Toner Low	Occurs when remaining cartridge toner is insufficient 1. Prepare to replace the cartridge
120 Tray1 Empty	Occurs when a task was sent to 1 Tray while there's no paper (main tray) 1. Check the operation status of tray 1 empty sensor flag 2. Check if tray 1 empty sensor is operating (Diagnosis Mode) 3. If it does not operate, replace the sensor and test again
121 Tray2 Empty	Occurs when a task was sent to Tray 2 while there's no paper (option tray) 1. Check the operation status of tray 2 empty sensor flag 2. Check if tray 2 empty sensor is operating (Diagnosis Mode) 3. If it does not operate, replace the sensor and test again
122 MPT Empty	Occurs when a MPT task was sent while there's no paper 1. Check the operation status of MPT empty sensor flag 2. Check if MPT empty sensor is operating (Diagnosis Mode) 3. If it does not operate, replace the sensor and test again
101 Paper Jam Tray1~Input path	Occurs when paper does not reach at the entrance sensor within a certain time after pick up attempt from copy tray (Even if 101 paper jam occurs when pickup from feeder fails, there might be a jammed paper on the paper path) 1. Check if papers are loaded properly (check feeder guide's status) 2. Check if there are too many papers in the tray 3. Check the paper status (check if paper is damaged or not) 4. Check if there's an obstacle between the tray and entrance sensor's paper path 5. Check if the pickup solenoid operates properly picks up 6. If it does not operate, replace the solenoid and test again 7. Check if entrance sensor works properly (Diagnosis Mode) 8. If it does not operate, replace the sensor and test again

Message	Description
102 Paper Jam Option~Input path	Occurs when paper does not reach at the entrance sensor within a certain time after pick up attempt from option tray (Even if 102 paper jam occurs when pickup from feeder fails, there might be a jammed paper on the paper path) 1. Check if papers are loaded properly (check feeder guide's status) 2. Check if there are too many papers in the tray 3. Check the paper status (check if paper is damaged or not) 4. Check if there's an obstacle between the tray and entrance sensor's paper path 5. Check if there is a communication problem between system card and option tray (Diagnosis Mode) 6. Check harnesses when problem occurs and if the problem still exists, replace the option board and test again. 7. Check if the pickup solenoid operates properly picks up 8. If it does not operate, replace the solenoid and test again 9. Check if entrance sensor works properly (Diagnosis Mode) 10. If it does not operate, replace the sensor and test again
103 Paper Jam MPT~Input path	Occurs when paper does not reach at the entrance sensor within a certain time after pick up attempt from MPT (Even if 102 paper jam occurs when pickup from MPT fails, there might be a jammed paper on the paper path) 1. Check if papers are loaded properly (check feeder guide's status) 2. Check if there are too many papers in the tray 3. Check the paper status (check if paper is damaged or not) 4. Check if there's an obstacle between the tray and entrance sensor's paper path 5. Check if the pickup solenoid operates properly picks up 6. If it does not operate, replace the solenoid and test again 7. Check if entrance sensor works properly (Diagnosis Mode) 8. If it does not operate, replace the sensor and test again
104 Paper Jam Input~Exit path	Occurs when paper's top does not reach at the delivery sensor within a certain time after passing the entrance sensor 1. Check if there's an obstacle between the entrance sensor and delivery sensor's paper path 2. Check if delivery sensor works properly (Diagnosis Mode) 3. If it does not operate, replace the sensor and test again
105 Paper Jam Input~Exit path	Occurs when paper's bottom does not get out entrance sensor within a certain time 1. Check if there's an obstacle on paper delivery path after the delivery sensor 2. Check if entrance sensor works properly (Diagnosis Mode)

	3. If it does not operate, replace the sensor and test again
106 Paper Jam Exit path	Occurs when paper's bottom does not get out the delivery sensor within a certain time 1. Check if there's an obstacle on paper delivery path after the delivery sensor 2. Check if delivery sensor works properly (Diagnosis Mode) 3. If it does not operate, replace the sensor and test again
107 Paper Jam Duplex path	Occurs when paper jam occurs at Duplex Unit's path 1. Check if there's an obstacles on Duplex Unit's paper path 2. Check if duplex solenoid operates properly 3. If it does not operate, replace the solenoid and test again 4. Check if entrance sensor works properly (Diagnosis Mode) 5. If it does not operate, replace the sensor and test again
Drum cartridge change	Occurs when drum cartridge should be replaced. 1. Replace drum cartridge.
Output Bin Full	Occurs when output bin is full of paper. 1. Remove paper from output bin.
Wi-Fi Conn. Fail	Connection to selected wireless AP has failed. 1. Check if wireless AP is working. 2. If you set a password, check and re-enter 3. Shorten distance between wireless AP and retry

Messages and Error Codes (A611DN)

Service Error Codes

Generally, it is not possible to recover when service error code is displayed, but temporary errors may disappear when POR the printer.

Service Error Code (3xx)

Error	Description	Action
300	Fuser under temperature while printing	Occurs when Fusing temperature is lower than the set temperature for more than 30 seconds while printing 1. Check the harness between Fusing and power unit 2. If the problem is not solved, replace the Fusing unit
301	Fuser under temperature while at standby	Occurs when Fusing temperature is lower than the set temperature for more than 30 seconds during stand by 1. Check the harness between Fusing and power unit 2. If the problem is not solved, replace the Fusing unit
302	Fuser failed to reach standby temperature	Occurs when Fusing temperature does not reach stand-by temperature within 90 seconds after POR 1. Check the harness between Fusing and power unit 2. Check the harness between system card and thermistor 3. If the problem is not solved, replace the Fusing unit
303	Fuser over temperature	Occurs when Fusing temperature goes over 235 degrees 1. Check the harness between Fusing and power unit 2. If the problem is not solved, replace the Fusing unit
304	Fuser thermistor failure	Occurs when Fusing temperature does not go over 35 degrees within 10 seconds after POR 1. Check the harness between Fusing and power unit 2. Check the harness between system card and thermistor 3. If the problem is not solved, replace the Fusing unit
305	Fuser under temperature while heating	Occurs when fuser temperature drops more than 5 degrees twice in a row while heating. 1. Check the harness between Fusing and power unit 2. If the problem is not solved, replace the Fusing unit

310	Printhead lost Hsync	Occurs when printer head cannot detect Hsync properly 3. Check the harness between system card and printer head 4. If the problem is not solved, replace the print head
311	Mirror motor lock failure	Occurs when print head's internal mirror motor does not reach target speed within the configured time 1. Check the harness between system card and printer head 2. If the problem is not solved, replace the print head
Error	**Description**	**Action**
320	Main motor lock failure	Occurs when driving motor does not reach target speed within the configured time 1. Check the harness between system card and driving motor unit 2. If the problem is not solved, replace the driving motor unit
330	Fan motor lock failure	Occurs when fan motor does not reach target speed within the configured time 1. Check the harness between system card and fan unit 2. If the problem is not solved, replace the fan unit
331	Sub Fan motor lock failure	Occurs when drum fan motor fails to reach target speed in set time 1. Check the harness between system card and fan unit 2. If the problem is not solved, replace the fan unit
332	Dev Fan motor lock failure	Occurs when Dev fan motor fails to reach target speed in set time 1. Check the harness between system card and fan unit 2. If the problem is not solved, replace the fan unit
340	Option Tray Lost link Error	Occurs when there's a communication problem between option tray 1. Check the harness between system card and option tray 2. If the problem is not solved, replace the option tray board

Service Error Code (9xx)

Error	**Description**	**Action**
910	Software Assert	System stopped due to software error while running 1. Check if problem recurs after POR. 2. Replace system card if problem recurs.
912	Software Segmentation Fault	System stopped due to false memory access while software was running. 1. Check if problem recurs after POR. 2. Replace system card if problem recurs.
920	DB recovery success	DB has been successfully restored after DB damage. 1. Wait to reboot

923	DB recovery failure – No backup DB	Attempts to restore DB failed. No backup DB. 1. Check if problem recurs after POR. 2. Replace system card if problem recurs.
924	DB recovery failure – backup DB integrity check fail	Attempts to restore DB failed. Backup DB damaged. 1. Check if problem recurs after POR. 2. Replace system card if problem recurs.
925	DB recovery failure – backup DB copy fail	Attempts to restore DB failed. Failed to copy DB. 1. Check if problem recurs after POR. 2. Replace system card if problem recurs.

User Interactive Messages and Paper Jam Message

Paper jam and paper jam messages occur with the following reasons.

- Bad pickup solenoid or solenoid cam abrasion
- Flag and spring defect
- Standard guide backup roller abrasion
- Inappropriately adjusted standard guide
- Obstacles in paper path
- Different paper length than the length assigned from driver

User Interactive Messages & Paper Jam Messages (1xx)

Message	Description
Re-Insert Cartridge	Occurs when printer has failed to recognize cartridge or when cartridge has not been installed. 4. Reinstall cartridge and check if the problem recurs. 5. Check the contacting point of the Smart IC card in the cartridge and the system card. 6. Replace cartridge.
Toner Cartridge Change	Occurs when cartridge has expired. 1. Replace cartridge.
Replace Cartridge Error	Occurs when a non-authentic, reusable cartridge is used. 1. Replace with an authentic cartridge.
Toner Low	Occurs when more than the cartridge's capacity has been used (1000 or 500 sheets). (1000 sheets for 7K and above; 500 sheets for 7K and below)) (e.g. For 13K, message appears when 13000-1000 = 12000. For 3K, 3000-500 = 2500) 1.Print System Report to check amount of toner used.
Media Size Mismatch Error	Occurs when paper size on the driver differs from the paper in the printer. 1. Click OK to proceed. 2. Cancel if you do not wish to proceed.

Output Bin Stack Full Error	Occurs when the output bin is full. 1. Remove paper from output bin.
Paper Empty: T1	Occurs when a job is sent to tray 1 when it is empty.(Main tray) 4. Check Tray1 Empty Sensor flag status. 5. Check if Tray1 Empty Sensor is working. 6. If not, replace sensor and test again.
Paper Empty: T2	Occurs when a job is sent to tray 2 when it is empty (Optional tray). 1. Check Tray2 Empty Sensor flag status. 2. Check if Tray2 Empty Sensor is working. 3. If not, replace sensor and test again.
Message	**Description**
Paper Empty: T3	Occurs when a job is sent to tray 3 when it is empty (Optional tray). 1. Check Tray3 Empty Sensor flag status. 2. Check if Tray3 Empty Sensor is working. If not, replace sensor and test again.
Paper Empty: MPT	Occurs when a job is sent to MPT when it is empty. 1. Check MPT Empty Sensor flag status. 2. Check if MPT Empty Sensor is working. 3. If not, replace sensor and test again.
100 MPT Miss Feed Jam	Occurs when paper fails to reach the entrance sensor within set time after being picked up from MPT. (Although 100 MPT Miss Feed Jam message is displayed, if MPT has failed to pick up paper there may not be a paper jam in the path.) 1. Check whether paper has been properly loaded in the tray (check tray guide condition). 2. Check whether the tray has not been overloaded. 3. Check paper condition (whether it has been damaged) 4. Check whether paper path between tray and entrance sensor is clear. 5. Check whether the pickup solenoid is working. 6. If not, replace the solenoid and test again. 7. Check whether the entrance sensor is working (Diagnosis mode) 8. If not, replace sensor and test again.
101 Tray1 Miss Feed Jam	Occurs when paper fails to reach the entrance sensor within set time after being picked up from main tray. (Although 101 Tray1 Miss Feed Jam message is displayed, if Tray 1 has failed to pick up paper there may not be a paper jam in the path.) 1. Check whether paper has been properly loaded in the tray (check tray guide condition). 2. Check whether the tray has not been overloaded. 3. Check paper condition (whether it has been damaged) 4. Check whether paper path between tray and entrance sensor is clear. 5. Check whether the Pickup DC motor is working. 6. If not, replace the DC motor and test again. 9. Check whether the entrance sensor is working (Diagnosis mode) 7. If not, replace sensor and test again.

Message	Description
102 Tray2 Miss Feed Jam	Occurs when paper fails to reach the entrance sensor within set time after being picked up from optional tray. (Although 102 Tray2 Miss Feed Jam message is displayed, if the optional tray has failed to pick up paper there may not be a paper jam in the path.) 1. Check whether paper has been properly loaded in the tray (check tray guide condition). 2. Check whether the tray has not been overloaded. 3. Check paper condition (whether it has been damaged) 4. Check whether paper path between tray and entrance sensor is clear. 5. Check if there is a problem in communication between the system card and the optional tray (Diagnosis mode). 6. Check harness. If problem persists, replace the option board and tray again. 7. Check whether the Pickup DC motor is working. 8. If not, replace the DC motor and test again. 9. Check whether the entrance sensor is working (Diagnosis mode) 10. If not, replace sensor and test again.
103 Tray3 Miss Feed Jam	Occurs when paper fails to reach the entrance sensor within set time after being picked up from optional tray. (Although 103 Tray3 Miss Feed Jam message is displayed, if the optional tray has failed to pick up paper there may not be a paper jam in the path.) 1. Check whether paper has been properly loaded in the tray (check tray guide condition). 2. Check whether the tray has not been overloaded. 3. Check paper condition (whether it has been damaged) 4. Check whether paper path between tray and entrance sensor is clear. 5. Check if there is a problem in communication between the system card and the optional tray (Diagnosis mode). 6. Check harness. If problem persists, replace the option board and tray again. 7. Check whether the Pickup DC motor is working. 8. If not, replace the DC motor and test again. 9. Check whether the entrance sensor is working (Diagnosis mode) 10. If not, replace sensor and test again.

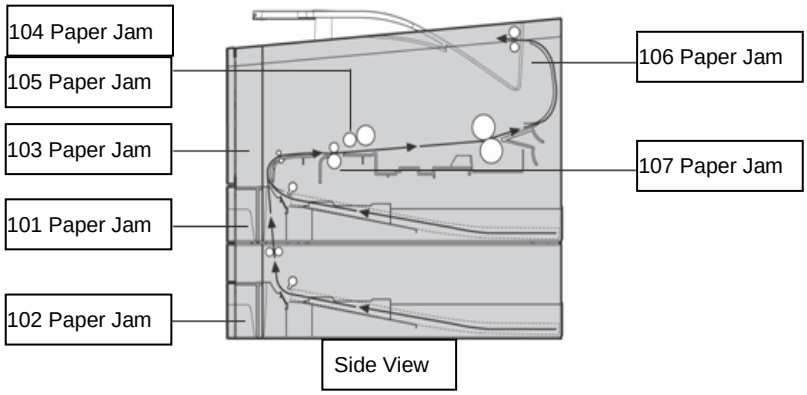
Message	Description
104 Paper Jam	Occurs when paper's top does not reach at the delivery sensor within a certain time after passing the entrance sensor 4. Check if there's an obstacle between the entrance sensor and delivery sensor's paper path

	5. Check if delivery sensor works properly (Diagnosis Mode) 6. If it does not operate, replace the sensor and test again
105 Paper Jam	Occurs when paper's bottom does not get out entrance sensor within a certain time 4. Check if there's an obstacle on paper delivery path after the delivery sensor 5. Check if entrance sensor works properly (Diagnosis Mode) 6. If it does not operate, replace the sensor and test again
106 Paper Jam	Occurs when paper's bottom does not get out the delivery sensor within a certain time 4. Check if there's an obstacle on paper delivery path after the delivery sensor 5. Check if delivery sensor works properly (Diagnosis Mode) 6. If it does not operate, replace the sensor and test again
107 Paper Jam	Occurs when paper jam occurs at duplex unit's path 6. Check if there's an obstacles on duplex unit's paper path 7. Check if duplex solenoid operates properly 8. If it does not operate, replace the solenoid and test again 9. Check if entrance sensor works properly (Diagnosis Mode) 10. If it does not operate, replace the sensor and test again

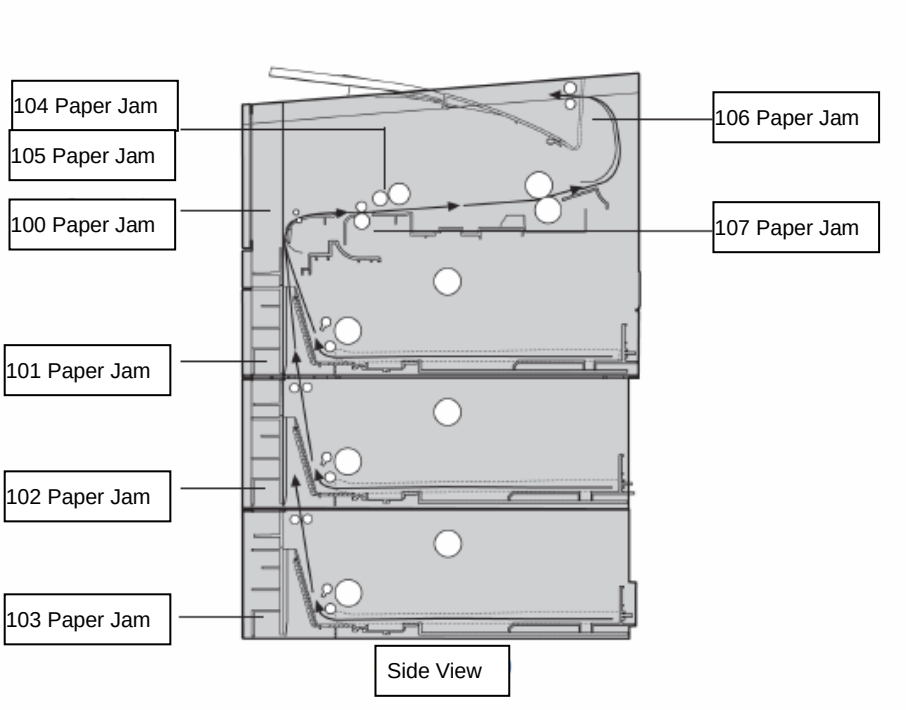
Paper Jam

Most of paper jams occur by inappropriate print paper or incorrect paper loading.
If a paper jam message is displayed from a paper jam, all the papers jammed on the entire path must be eliminated to remove the message

Next figure displays the paper's internal path. Paper path varies by the tray (copy tray, option tray and bypass tray) and paper discharge direction. See the "**Paper Jam Message**" described above for details.



(A610/615DN)



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⚠CAUTION

Slowly and softly pull the jammed paper to not to tear the jammed paper. If possible, use both hands with even strength to remove the jammed paper.

Error Log- Error Code

Errors in error logs and solutions are explained in this section.

Error Code

- Types of error: Error, Fatal
- ErrorType: Can be solved by user
- FatalType: Cannot be solved by user

⇨ Device errors are most common

General Error

00-xxx: S/W-related Errors

Type	Error	Code	00-060
Client	Host Print (PDL) / Report Generator / System Manager		
Description			
- Image file name was not properly received. - Name of image file to be printed is too long. - BMP or Gif file may be broken.			
Solution			
- If error has occurred while printing an image file, check the file name and USB Disk. - Check if BMP or Gif files are read properly on your PC.			

01-xxx: Engine-related Errors

Type	Error	Code	01-003
Client			
Description			
Re-Insert Cartridge Error (Smart IC authentication failed) - Occurs when the model of the printer is incompatible with the model of the cartridge. - Occurs when connection between cartridge and printer is not good.			
Solution			
Check whether the models are compatible. Check whether the chip installed in the cartridge is free of toner powder, etc. and clean cartridge. Check the condition of the spring in the connection unit.			

Type	Error	Code	01-005
Client			
Description			
Re-Insert Cartridge Error (Smart IC authentication failed) - Occurs when the model of the printer is incompatible with the model of the cartridge. - Occurs when connection between cartridge and printer is not good.			
Solution			
Check whether the models are compatible. Check whether the chip installed in the cartridge is free of toner powder, etc. and clean cartridge. Check the condition of the spring in the connection unit.			

Type	Error	Code	01-007
Client			
Description			
Media Size Mismatch Error (Selected paper size does not match paper size in tray)			
Solution			
Place correct paper size in tray and press Start on OP to proceed.			

Type	Error	Code	01-008
Client			
Description			
Output Bin Stack Full Error (Paper stack in output bin has exceeded the limit)			
Solution			
Empty the Output Bin.			

Type	Error	Code	01-101
Client			
Description			
Front Cover Open Error – (Not printed in Error Report			
Solution			
Close front cover.			

Type	Error	Code	01-201
Client			
Description			

Engine Jam 101 (Tray1 Miss Feed Jam) - Paper miss feed in Tray1 (Main Tray)
Solution
Check for obstacles in Tray1 paper path (torn paper, etc.). Check condition of Pick up Roller or Tray Pad. If Tray1 Empty Sensor is faulty, paper pickup from empty tray may cause 101 Jam.

Type	Error	Code	01-202
Client			
Description			
Engine Jam 102 (Tray2 Miss Feed Jam) - Paper miss feed in Tray2 (Optional Tray)			
Solution			
Check for obstacles in Tray2 paper path (torn paper, etc.). Check condition of Pick up Roller or Tray Pad. If Tray2 Empty Sensor is faulty, paper pickup from empty tray may cause 102 Jam.			

Type	Error	Code	01-203
Client			
Description			
Engine Jam 103 (MPT Miss Feed Jam) - Paper miss feed in MPT (Manual Tray)			
Solution			
Check for obstacles in MPT paper path (torn paper, etc.). Check condition of Pick up Roller or Tray Pad. If MPT Empty Sensor is faulty, paper pickup from empty tray may cause 103 Jam.			

Type	Error	Code	01-204
Client			
Description			

Engine Jam 104 (Output Sensor failed to detect front of paper) - Occurs when the front part of paper fails to reach the Output Sensor (in Fuser Unit)
Solution
Check for obstacles in paper path.

Type	Error	Code	**01-205**
Client			
Description			
Engine Jam 105 (Input Sensor failed to detect end of paper) - Occurs when the end of paper failed to leave Input Sensor			
Solution			
Check for obstacles in paper path.			

Type	Error	Code	**01-206**
Client			
Description			
Engine Jam 106 (Output Sensor failed to detect end of paper) - Occurs when the end of paper failed to leave Output Sensor			
Solution			
Check for obstacles in paper path.			

Type	Error	Code	**01-207**
Client			
Description			
Engine Jam 107 (Duplex Jam) - Occurs when paper failed to reach Input Sensor after leaving Duplex path			
Solution			
Check for obstacles in duplex path.			

05-xxx: File-related Error (Print from USB Memory, Scan to USB Memory/Email/FTP)

Type	Error	Code	**05-001**
Client	Report Client		
Description			
File you attempted to print is too big.			

Solution
This file cannot be printed. (Not supported)

Type	Error	Code	**05-002**
Client	Report Client		
Description			
This file is: Does not have recognizable format, OR was saved in Jpeg Progressive format, OR a Jpeg, BMP, or Gif file with broken format. OR a Gif file saved as Interlace, OR image 0 in length and width.			
Solution			
This image file is unusable.			

Type	Error	Code	**05-003**
Client	Report Client		
Description			
Width/Length ratio of image is smaller than 1/5 or larger than 5. Length of image is too large to be processed.			
Solution			
This image file cannot be printed.			

Type	Error	Code	05-004
Client	Report Client		
Description			
File selected in UI does not exist.			
Solution			
Check connection with USB Disk (bad connection) USB Disk may be broken.			

Type	Error	Code	05-005
Client	Report Client		
Description			
Gif file was recognized to be faulty while being printed			

OR image file you attempted to print has a path too deep or name too long.
Solution
Gif file: Cannot be printed because it is broken. If not, file name is too big. Shorten and retry.

Type	Error	Code	05-006
Client	Report Client		
Description			
Broken file detected while printing.			
Solution			
This file cannot be used.			

Type	Error	Code	05-008
Client	Report Client		
Description			
File data could not be read. USB Memory may have been broken while printing.			
Solution			
Check the file size. Copy to a new USB and retry.			

06-xxx : Feeding Tray-related Error

Type	Error	Code	06-601
Client	Host Print (GDI, PDL)		
Description			
Tray1 Empty Error			
Solution			
Load Tray1 and press Start on UI to proceed.			

Type	Error	Code	06-602
Client	Host Print (GDI, PDL)		
Description			
Tray2 (Option) Empty Error			
Solution			
Load Tray2 (Option) and press Start on UI to proceed.			

Type	Error	Code	06-681
Client	Host Print (GDI, PDL)		
Description			
MPT Empty Error			
Solution			
Load MPT and press Start on UI to proceed.			

Fatal Error

00-xxx: S/W Error

Type	Fatal	Code	00-001
Client	Report Client		
Description			
Wrong image file on SkewPage / QualityPage. Failed to change string when printing report.			
Solution			
Re-update code and refresh file system.			

Type	Fatal	Code	00-002
Client	Report Client		
Description			
Image file was too big. Wrong text value in Report.			
Solution			
If an error has occurred while printing, the file is not supported. Report printing error: Re-update code and refresh file system.			

Type	Fatal	Code	00-003
Client	Report Client		
Description			
Attempted to print an unsupported image format (Interleave).			
Solution			
This file is not supported.			

Type	Fatal	Code	00-004
Client	Report Client		
Description			
Attempted to print an unsupported image format (TiFF).			
Solution			
This file is not supported.			

Type	Fatal	Code	00-005

Client	Report Client
Description	
Printing S/W error while printing Report/Skew/Quality Page Printing SW error while printing file.	
Solution	
Reboot. If problem recurs, update code and refresh the file system.	

Type	Fatal	Code	00-007
Client	All		
Description			
Unknown S/W memory error. This error may include Printing Stop.			
Solution			
Reboot and retry.			

Type	Fatal	Code	00-008
Client	Function Process		
Description			
Printer S/W malfunctioned during operation. Uncommon error.			
Solution			
Reboot and retry.			

Type	Fatal	Code	00-009
Client	Function Process		
Description			
Printer S/W malfunctioned during operation. Uncommon error.			
Solution			
Reboot and retry.			

Type	Fatal	Code	00-062
Client	Function Process / Report Generator		
Description			

Memory initialization failed while booting Ran out of LIPP memory space while creating report (may occur for newspaper, etc.) Ran out of memory space while printing JPEG file Length of JPEG, BMP, or GIF file was too big Ran out of memory space while printing SKEW page Ran out of memory space for unzipping while printing Report page Ran out of memory space while printing Quality page Selected abnormal value on Page Print.
Solution
Request for technical support. Error while printing Report/Skew/Quality: Reboot. If problem recurs, update code and refresh file system.

Type	Fatal	Code	**00-100**
Client	Function Process		
Description			
Has TLI not recognizable by device, OR an error occurred in exe. program.			
Solution			
Enter new TLI			

Type	Fatal	Code	**00-102**
Client	System Manager		
Description			
DB in device is damaged. Important information including TLI may have been damaged.			
Solution			
Replace System Card Faulty cards should have the low level code renewed first via daughter card.			

Type	Fatal	Code	**00-105**
Client	Function Process		
Description			

Attempted to make a copy on KARA, OR send a fax to a device that does not have a fax.
Solution
Does not occur in products not in development.

Type	Fatal	Code	**00-106**
Client	Function Process		
Description			
Required client failed while booting.			
Solution			
Replace system card if 00-106 occurred while booting. Faulty cards should have the low level code renewed first via daughter card..			

Type	Fatal	Code	**00-107**
Client	HostPrint(OPL), HostPrint(PDL)		
Description			
Not enough memory for printing. This error does not occur in normal situations. LIPP(S/W) may have wrong calculation. Not related to device. Printing Stop may occur.			
Solution			
Reboot and retry.			

01-xxx: Engine-related

Type	Fatal	Code	**01-001**
Client			
Description			
Engine S/W Error - Occurs when there is a problem in communication line (I2C – Cartridge & Option)			
Solution			
Remove option and retry. (Option L SW is not compatible with main MH model – Option FW update required) If error occurs when there is no option, replace tray and retry.			

Type	Fatal	Code	**01-410**

Client	
Description	
Engine Fuser 300 Fatal Error (Fuser under temperature on printing state) - Occurs when fuser temperature drops while printing.	
Solution	
Reboot and retry. Replace Fuser Unit if problem persists.	

Type	Fatal	Code	01-411
Client			
Description			
Engine Fuser 301 Fatal Error (Fuser under temperature on standby state) - Occurs when fuser temperature drops while on standby.			
Solution			
Reboot and retry. Replace Fuser Unit if problem persists.			

Type	Fatal	Code	01-412
Client			
Description			
Engine Fuser 302 Fatal Error (Fuserfailed to reach standby temperature) - Occurs when Fuser Unit is not ready for printing after power has been turned on.			
Solution			
Reboot and retry. Replace Fuser Unit if problem persists.			

Type	Fatal	Code	01-413
Client			
Description			
Engine Fuser 303 Fatal Error (Fuser over temperature) -Occurs when fuser has overheated.			
Solution			
Reboot and retry. Replace Fuser Unit if problem persists.			

Type	Fatal	Code	01-414
Client			
Description			
Engine Fuser 304 Fatal Error (Fuser thermistor failure) - Occurs when thermistor is not properly working.			
Solution			
Reboot and retry. Replace Fuser Unit if problem persists.			

Type	Fatal	Code	01-420
Client			
Description			
Engine Hsync Fatal Error - Occurs when device fails to detect LSU sync.			
Solution			
Reboot and retry. Replace LSU if problem persists.			

Type	Fatal	Code	01-501
Client			
Description			
Engine Feed Motor Fatal Error - Occurs when main motor failed to reach fixed speed			
Solution			
Reboot and retry. Replace Main Motor if problem persists.			

Type	Fatal	Code	01-502
Client			
Description			
Engine Mirror Motor Fatal Error - Occurs when Mirror Motor in LSU failed to reach fixed speed			
Solution			
Reboot and retry. Replace LSU if problem persists.			

Type	Fatal	Code	01-503
Client			
Description			
Engine Fan Motor Fatal Error - Occurs when Main Fan (near power unit) failed to reach fixed speed			
Solution			
Reboot and retry. Replace Main Fan if problem persists.			

Type	Fatal	Code	01-505
Client			
Description			
Engine Sub-Fan Motor Fatal Error - Occurs when Sub Fan (small fan next to Main board) failed to reach fixed speed			
Solution			
Reboot and retry. Replace Sub Fan if problem persists.			

Service Menu (A610DN)

Diagnosis Menu

This chapter describes to check occurred errors and tests and procedures to repair the error.

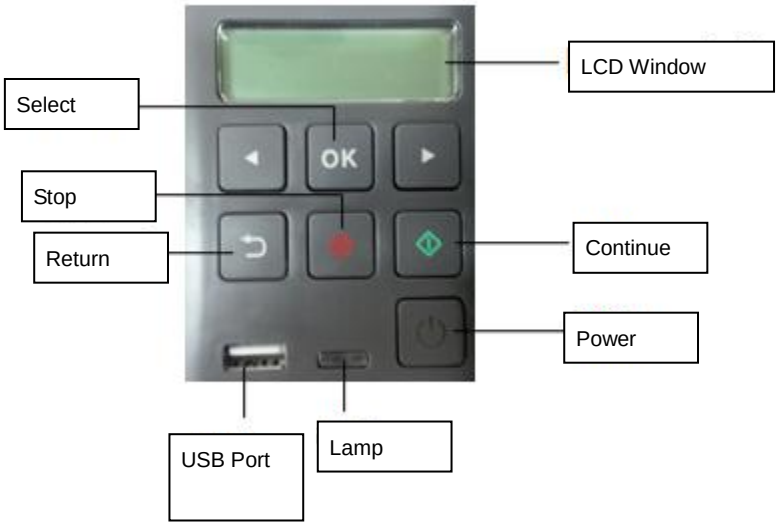
Most of service modes can be used by selecting special keys during POR.

Diagnosis Mode

In order to run the Diagnosis test described in this chapter, you need to enter Diagnosis Mode.

The configurations and operations used for machine manufacturing and servicing are included in the Diagnosis Mode group.

Entering Diagnosis Mode



1. Turn the machine’s power on.
2. Push either arrow button on Ready.
3. Press Stop key twice.
4. Press the Select key.
5. When password is indicated, press left arrow once and right arrow once.
6. Press the Select key.

Diagnosis Mode menus are displayed on the panel in following orders.

Service Mode - Snapshot version
- General Service - Button Test
- Advanced Report

- Printer Service - PRT Registration - Margin Adjust - Left Margin
- Top Margin
- Back Left Margin
- Back Top Margin
- Magnification - Horizontal
- Vertical
- Print Skew Page
- Print Skew (B-Se)
- Beam Adjust
- Drum Lock Enable
- Hardware Test - Sensor Test
- Solenoid Test
- Quality Pages
- Printer Setup - Page Count
- Perm. Page Count
- Error Log - Display Log
- Print Log
- Clear Log

To exit the Diagnosis Mode, press the **Return** button from the top menu to return to general mode.

Snapshot version

■ **Snapshot version**

Shows firmware version of current device
e.g. KARA_130723[1]

■ Advanced Report

Page for managing data collected by the imaging technology development part

Shows history of Machine, Toner and Drum usage.

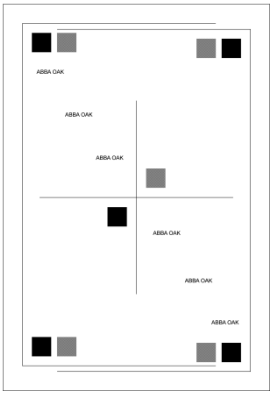
- Job by modes (1,2,3,… pages): Number of jobs printed equivalent to page number
- Cartridge History (3K, 6K, 9K, 13K): Number of toner by size
- Toner Cartridges (Oldest, Newest): Toner Cartridge installed (Only records recent 10)
- Printed by coverage (percent): Number of pages printed compared to toner capacity
- Free motor on: Motor rotation time (not including printing time) (sec)
- REGISTRATION
-

■ Margin Adjustment

To print margin adjustment:

1. Select **REGISTRATION** from Diagnosis Mode.
2. Select **Margin Adjust**.
3. Select a value to change from **Top Margin, Bottom Margin, Left Margin** and **Right Margin**.
4. Press the **arrow keys** to set desired value and press **Select key**.
   Print margin range goes as follows and can be changed with unit of 1 (0.2mm).

Category	Value
Top Margin	-25 ~ +25
Left Margin	-25 ~ +25



Adjust Top Margin by +5: Image moves down 1mm

Adjust Top Margin by -5: Image moved up 1mm

Adjust Left Margin by +5: Image moves to the right by 1mm

Adjust Left Margin by -5: Image moves to the left by 1mm

5. To exit, press **Return**.

Select **Print Skew Page** in Menu. Print on Letter or A4.

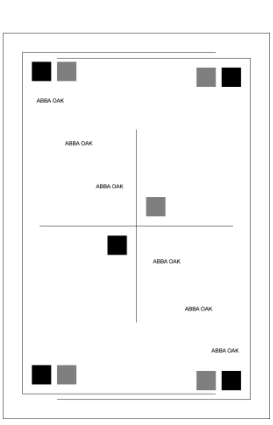
■ **Magnification**

Magnification

To adjust magnification:

1. Select **REGISTRATION** from Diagnosis Mode.
2. Select **Magnification**.
3. Select a value from either **Vertical or Horizontal**.
4. Press the **arrow keys** to set desired value and press **Select** key.
   Magnification ranges that can be configured are as the following. (1 unit= 0.5%)

Description	Value
Vertical Magnification	-5 ~ 5 (default: 0)
Horizontal Magnification	-5 ~ 5 (default: 0)



Horizontal Magnification +5: Image is enlarged horizontally by 0.5%

Horizontal Magnification -5: Image is reduced horizontally by 0.5%

Vertical Magnification +5: Image is enlarged vertically by 0.5%

Vertical Magnification -5: Image is reduced vertically by 0.5%

5. Press Return to exit.

■ **Print Skew Page**

Print the Skew Test Page that can check the changes after changing margins or magnification. When each configuration was changed, select this menu to check the changed results.

BEAM ADJUST

- **Beam Adjust**

Adjust LSU Beam Power (light intensity). Image intensifies as value increases from the default +73 and blurs as value decreases.

DRUM LOCK ENABLE

- **Drum Lock Enable**

You can decide to enable or disable drum use when it exceeds the recommended usage (50K based on Drum Life Page Count). Default option is ON. Drum Lock Error occurs when recommended drum usage has been exceeded and is Disabled.

HARDWARE TESTS

- **Button Test**

1. Select **Button Test** from diagnosis mode.
2. To test operations of each button, press each button on the Control Panel once and see if names of each key are displayed on LCD. But, for **Return** button, it is used as to exit the test menu, it will not be displayed, but exits the test.
3. Press **Return** to cancel the test.

- **Sensor Test**

This test is used as to check if all the sensors and switches installed in the machine operates properly or not.

The sensors and switches that can be checked from the sensor test mode are the

followings:

- Input Sensor
- Exit Sensor
- Tray1 Empty Sensor
- Tray2 Empty Sensor
- MPT Empty Sensor
- Front / Rear Cover

To run the Sensor Test:

1. Select **Hardware Test** from diagnosis mode.
2. Select Sensor Test. (Entering sensor test mode completed)

When 6 sensors and switches listed above change its status during the sensor test mode, the status will be displayed on LCD.
For example, if you close and open cover continuously during the sensor test mode and 'Cover open/close' message appears normally, the status of cover switch is normal. If message is not displayed properly, there's a problem with cover switch status and it needs to be inspected.

■ **Solenoid Test**

This test is used as to check if all solenoids installed in the machine operate properly or not.

The solenoids that can be checked from the solenoid test mode are the followings:

- MPT Pick up Solenoid
- Duplex Solenoid

To run the solenoid test:

1. Select **Device Test** from Diagnosis Mode.
2. Select Solenoid Test. (Entering solenoid test mode completed and start test)

When solenoid test starts, 3 solenoids listed above are turned on at the same time, then

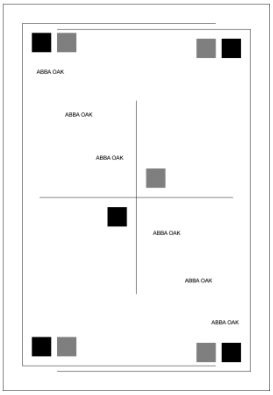
off after 2 seconds.

- **Quality Pages**

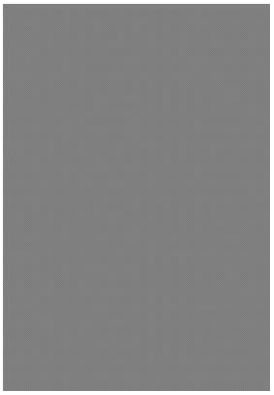
To print the print quality page:

1. Select **PRINT TESTS** from Diagnosis Mode.
2. Select **Quality Pages.**
   2 pages will be printed. Button operations will be ignored until pages are printed.

First page is a skew adjusting page and the other page is a print quality checking page.



For checking skew



For checking print quality

PRINTER SETUP

- **Page Count**

You can check and modify the page count value.
To modify the page count:

1. Select **Page Count** from **PRINTER SETUP** menu.
2. You can increase or decrease a 100-digit number using **arrow keys.** Press **Select** to save changes.
3. Press **Return** to cancel changes while setting count value.

- **Perm Page Count**
  - Permanent page count can be seen from this menu option. The permanent page

count cannot be changed from Control Panel by a user or technical engineer.

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ERROR LOG

■ Display Log

Error log offers the printer's error history. Up to recent 12 printer errors are displayed. Most recent error is on position 1 and oldest is on position 12 (when 12 errors have occurred). When the log is full and an error occurs, the oldest error gets deleted.

To view error log:

1. Select **Display Log** from **Error Log** menu.
   Error log displays 4 errors in three times as the figure. To move to next screen, press **Continue**.

   For example:

1-200	2-920
3-928	4-922

5-250	6-990
7-230	8-230

9-953	10-000
11-000	12-000

   The most recent error here is the error 200. Positions 10, 11 and 12 do not have recorded codes.

2. To exit error log, press **Return**.
   .

■ Print Log

Error log can be printed from additional analysis information.

To print error log:

1. Select **Print Log** from **Error Log** menu.
2. To exit **Error Log** menu, press **Return**.

Examples of an error log:

01-205,	[Engin jam on input/output sensor]	**←See Error code list**
Error type:	Recoverable	**← (Non) Recoverable**
Uptime:	1 day 12 hour 03 min 25 sec	**← Time after ON**

(KARA: No internal battery. Time setting function not available)

■ Clear Log

1. Select **Clear Log** from **Error Log** menu.
2. **Clear Log?** is displayed.
3. Press **Select** to clear log. To exit without clearing log, press **Return**.

Service Menu (A611DN)

Diagnosis Menu

This chapter describes to check occurred errors and tests and procedures to repair the error.

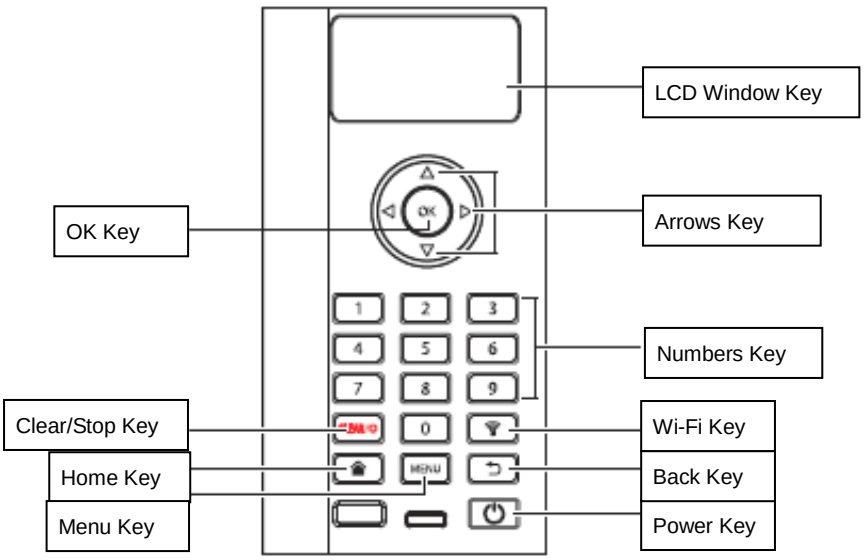
Most of service modes can be used by selecting special keys during POR.

Diagnosis Mode

In order to run the Diagnosis test described in this chapter, you need to enter Diagnosis Mode.

The configurations and operations used for machine manufacturing and servicing are included in the Diagnosis Mode group.

Entering Diagnosis Mode



7. Turn on the power.
8. Press <1>, <0> and <7> in order in Ready mode.
9. Press <Clear/Stop>.

Diagnosis Mode menus are displayed on the panel in following order.

Service Mode - General service - Snapshot version
- SP report
- System recovery

- Printer service - PRT registration - Margin adjust - Left margin
- Top margin
- Back left margin
- Back top margin
- Magnification - Horizontal
- Vertical
- Print skew page
- Print skew (B-Se)
- A4-LT Margin Gap
- Beam Adjust
- Hardware Test - Quality Pages
- Sensor Test
- Solenoid Test
- T1 motor test
- T2 motor test
- T3 motor test
- Printer Setup - Page Count
- Perm. Page Count
- Error Log - Print Log
- Clear Log

- Port filtering - FTP
- SSH
- TELNET
- SMTP
- HTTP
- IPP
- RAW
- ALL

Press <Back> to go to previous item. Press <Home> or <Back> from the top item in Service mode to return to Home screen.
Use <Menu> to go to Settings.

General Service

- **Snapshot version**

Shows firmware version of current device
e.g. PINETREE_140109_2

- **SP Report**

Page for managing Drum and Toner IC usage and service mode
Shows Machine, Toner and Drum usage history. as well as Margin/Magnification setting, Beam Power setting, etc.

- Job by modes (1,2,3,… pages): Number of jobs printed equivalent to page number
- Cartridge History (3K, 6K, 9K, 13K): Number of toner by size
- Toner Cartridges (Oldest, Newest): Toner Cartridge installed (Only records recent 10)
- Printed by coverage (percent): Number of pages printed compared to toner capacity
- Free motor on: Motor rotation time (not including printing time) (sec)
- Margin Adjust: Margin setting of device
- Magnification: Magnification setting of device
- Beam Power Adjust: Beam Power setting of device

- **System recovery**

Perform Recovery of the system S/W to Factory version.
S/W is recovered after rebooting 2-3 times depending on the device condition.
Update to the latest F/W after system recovery if necessary.

Printer service

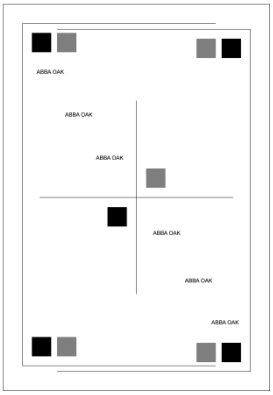
- **Margin Adjustment**

To adjust margin,

6. Select **PRT Registration** from Diagnosis Mode.
7. Select **Margin Adjust**.
8. Select margin to adjust: **Left margin, Top margin, Back-left margin, Back-top margin**
9. Press the **arrow keys** to set desired value and press **Select key**.

Print margin range goes as follows and can be changed with unit of 1 (=0.2mm).

Category	Value
Top Margin	-25 ~ +25
Left Margin	-25 ~ +25



Adjust Top Margin by +5: Image moves down 1mm

Adjust Top Margin by -5: Image moved up 1mm

Adjust Left Margin by +5: Image moves to the right by 1mm

Adjust Left Margin by -5: Image moves to the left by 1mm

10. To exit, press **Return**.

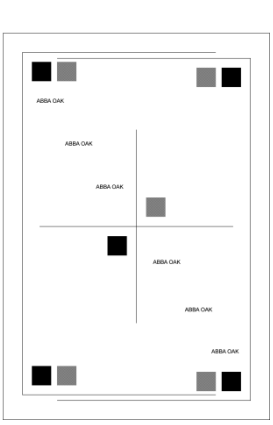
Select **Print Skew Page** from the menu to print on the letter or A4 paper.

■ Magnification

To adjust magnification:

6. Select **REGISTRATION** from Diagnosis Mode.
7. Select **Magnification**.
8. Select a value from either **Vertical or Horizontal**.
9. Press the **arrow keys** to set desired value and press **Select** key.
   Magnification ranges that can be configured are as the following. (1 unit = 0.5%)

Description	Value
Vertical Magnification	-5 ~ 5 (default: 0)
Horizontal Magnification	-5 ~ 5 (default: 0)



Horizontal Magnification +5: Image is enlarged horizontally by 0.5%

Horizontal Magnification -5: Image is reduced horizontally by 0.5%

Vertical Magnification +5: Image is enlarged vertically by 0.5%

Vertical Magnification -5: Image is reduced vertically by 0.5%

10. To exit, press **Return**.

Select **Print Skew Page(B-Se)** from the menu and print on Letter or A4.

■ **Print Skew Page**

Print the Skew Test Page that can check the changes after changing margins or magnification. When each configuration was changed, select this menu to check the changed results.

■ **A4-LT Margin Gap**

1. Enter value for left margin for double-sided A4. Enter additional value for left margin for double-sided Letter.
2. Margins printed are as follows. Margins can be modified to 1 unit (=0.2mm).

Category	Value
Top Margin	-25 ~ +25
Left Margin	-25 ~ +25

■ **Beam Adjust**

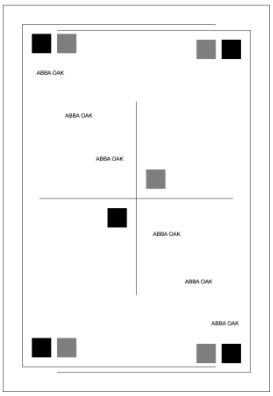
Adjust LSU Beam Power (light intensity). Image intensifies as value increases from the default +73 and blurs as value decreases. Shown in '%'.

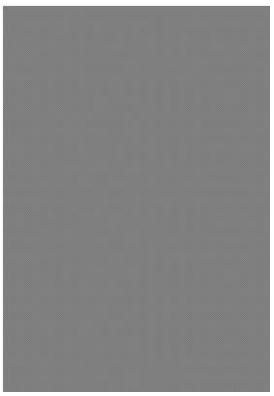
■ **Quality Pages**

To print the print quality page:

1. Select **PRINT TESTS** from Diagnosis Mode.
2. Select **Quality Pages.**
   2 pages will be printed. Button operations will be ignored until pages are printed.

First page is a skew adjusting page and the other page is a print quality checking page.





For checking skew For checking print quality

■ **Page Count**

You can check and modify the page count value.

To modify the page count:

4. Select **Page Count** from **PRINTER SETUP** menu.
5. You can increase or decrease a 100-digit number using **arrow keys.** Press **Select** to save changes.
6. Press **Return** to cancel changes while setting count value.

■ **Perm Page Count**

Permanent page count can be seen from this menu option. The permanent page count cannot be changed from Control Panel by a user or technical engineer.

■ Sensor Test

This test is used as to check if all the sensors and switches installed in the machine operates properly or not.

The sensors and switches that can be checked from the sensor test mode are the followings:

- Input Sensor
- Exit Sensor
- MPT Empty Sensor

To run the Sensor Test:

3. Select **Hardware Test** from diagnosis mode.
4. Select Sensor Test. (Entering sensor test mode completed)

When the 3 sensors and switches listed above change its status during the sensor test mode, the status will be displayed on LCD.
For example, if you press the MPT Empty Sensor during the sensor test mode and 'MPT : On / Off' message appears normally, the status of cover switch is normal. If message is not displayed properly, there's a problem with cover switch status and it needs to be inspected.

■ Solenoid Test

This test is used as to check if all solenoids installed in the machine operate properly or not.

The solenoids that can be checked from the solenoid test mode are the followings:

- MPT Pick up Solenoid
- Duplex Solenoid

To run the solenoid test:

3. Select HARDWARE TEST in Diagnosis Mode.
4. Select Solenoid Test (Entering solenoid test mode completed and start test)

When solenoid test starts, 3 solenoids listed above are turned on at the same time and turned off after 2 seconds.

- **T1 Motor Test**

This is a test for determining whether Tray 1 Pickup DC motor installed in the main body is working properly.

You can check the following motor in Tray 1 Motor Test Mode:

- Tray1 Pickup DC motor

To perform Tray 1 Motor Test:

1. Select HARDWARE TEST in Diagnosis Mode.
2. Select T1 motor test. (Entered Tray 1 Motor Test Mode. Test begins)

Once Tray 1 Motor Test begins, Tray1 Pickup DC motor is turned ON, then OFF automatically after 1 second.

- **T2 Motor Test**

This is a test for determining whether Tray 2 Pickup DC motor installed in the main body is working properly.

You can check the following motor in Tray 2 Motor Test Mode:

- Tray2 Pickup DC motor
- Tray2 Transport motor

To perform Tray 2 Motor Test:

1. Select HARDWARE TEST in Diagnosis Mode.
2. Select T2 motor test. (Entered Tray 2 Motor Test Mode. Test begins)

Once Tray 2 Motor Test begins, Tray2 Pickup DC motor and Tray2 Transport motor are turned ON. Tray2 Pickup DC motor is turned off automatically after 1 second, and Tray2 Transport motor after 2 seconds.

■ **T3 Motor Test**

This is a test for determining whether Tray 3 Pickup DC motor installed in the main body is working properly.

You can check the following motor in Tray 3 Motor Test Mode:

- Tray3 Pickup DC motor
- Tray3 Transport motor

To perform Tray 3 Motor Test:

1. Select HARDWARE TEST in Diagnosis Mode.
2. Select T3 motor test. (Entered Tray 3 Motor Test Mode. Test begins)

Once Tray 3 Motor Test begins, Tray3 Pickup DC motor and Tray3 Transport motor are turned ON. Tray3 Pickup DC motor is turned off automatically after 1 second, and Tray3 Transport motor after 2 seconds

Error log

■ **Print Log**

Error log can be printed from additional analysis information.

To print error log:

3. Select **Print Log** from **Error Log** menu.
4. To exit **Error Log** menu, press **Return**.

Error Log Example:

00-102, [102 Tray2 Miss Feed Jam] **←See Error code list**

Error type:	Recoverable	← Show (Non) Recoverable
Date:	2014-01-09 06:30:44	← Time Error Occurred

■ **Clear Log**

4. Select **Clear Log** from **Error Log** menu.
5. **Are you sure to clear?** is displayed.
6. Select **Yes** to clear log. To exit without clearing, select **No.**

Port Filter

Select Enable in Port Filter to enable filter. This means you can no longer use this port.
Select Disable to disable filter. This means you can use this port.

■ **FTP**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

■ **SSH**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

■ **TELNET**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

■ **HTTP**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

■ **SNMP**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

■ **IPP**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

■ **RAW**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

■ **ALL**

1. Enable (Filter On, Port Disabled)
2. Disable (Filter Off, Port Enabled)

Firmware Upgrade (A610DN)

Main Firmware Upgrade (Download)

Firmware Upgrade Using PC

0. Pre-setting

⦿ Connect device to PC using a USB cable.

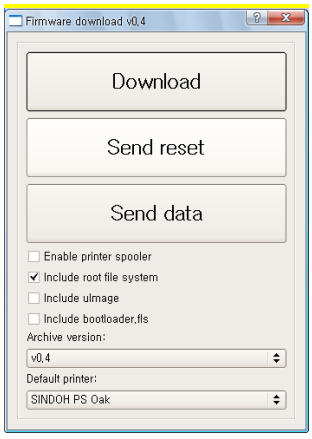
※ Note: A610 driver must be set to default printer on your PC.

1. Turn on printer.

2. Set printer as default in Printer & Fax.

3. Run FirmwareDownload_log.exe in Windows.

4. The following download window will appear.



5. Click Download. (Send reset, Send data buttons not required)

6. Firmware will automatically be updated. Red lamp will be turned on and status sill show on LCD.

7. Printer reboots after updating. ‘Ready’ means update has been successful.

Firmware Update Using USB Thumb Drive

0. Pre-setting

⦿ Copy Firmware file to “_update_kara” folder in USB Thumb Drive.

1. Wait until printer is ready.

2. Connect USB Thumb Drive to the printer’s USB port (next to LCD).

3. Click OK when the following message appears on the printer’s screen.

KARA_130722[1] Press any Key

4. Wait for update to be completed.

Update App. DO NOT TOUCH!	→	Update DB DO NOT TOUCH!

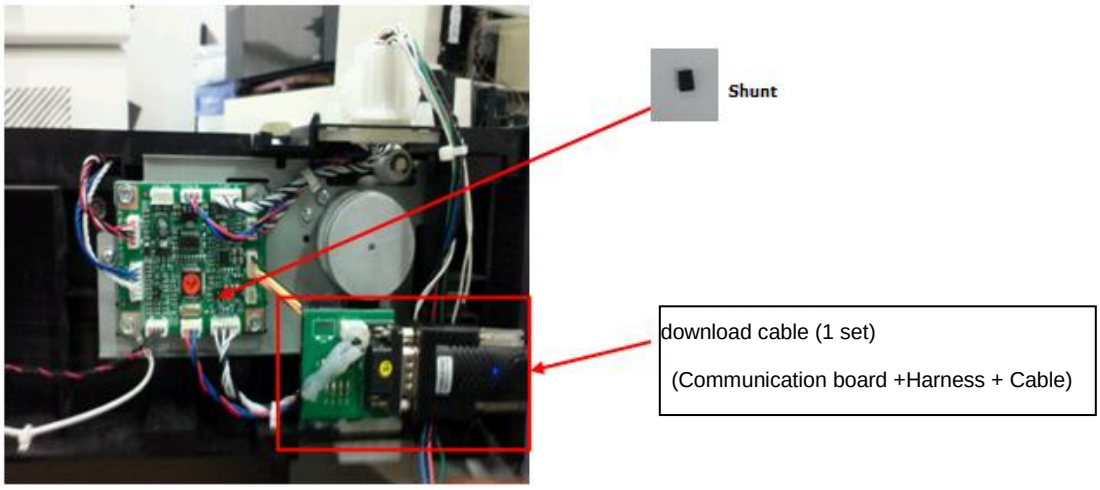
6. Check the following screen once update has been completed. Remove USB Thumb Drive and turn on printer.

Upgrade OK Eject USB/Reboot

Optional Tray Firmware Upgrade (Download)

Pre-setting (Step 1)

The download program (FlashSta) must be installed on PC and KARAbank.mot and KARA bank.id files must be in the same folder.



Proceed with the followings before running the download program.

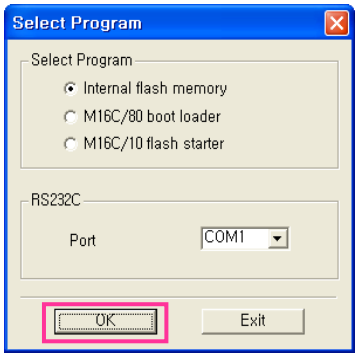
1. Turn the power off and plug Shunt on arrow to tray board as above figure.
2. Connect 1 set of download cable as the figure and connect it to serial port on PC.
3. When setting is completed as above figure, apply power.

Program Download (Step 2)

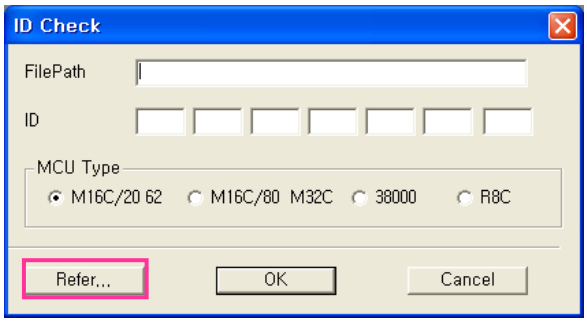
When step 1 is complete, run the FlashSta.exe file from PC.

Download will proceed as the followings.

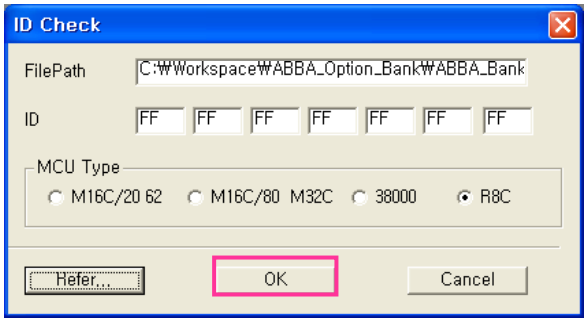
(Page 144)



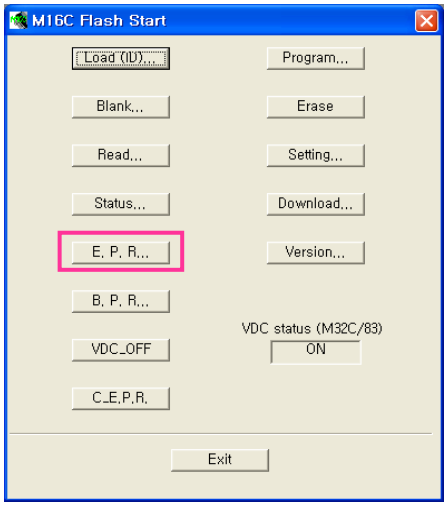
Step 1: Click OK.



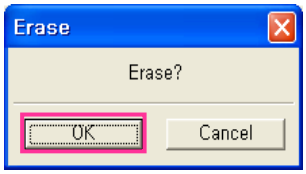
Step 2: Click Refer... and select and run ABBAbank.mot file from the folder.



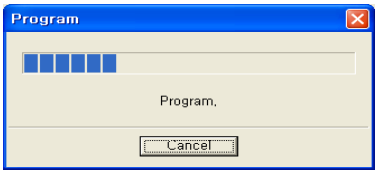
Step 3: When ID value is filled as above figure, click OK.



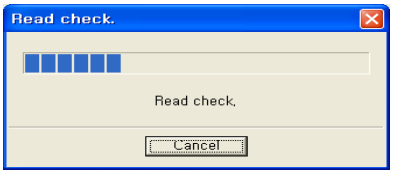
Step 4: Click E.P.R...



Step 5: Click OK.



Step 6: Downloading the program



Step 7: From Read Check.

Program Download (Step 2)

Step 8: Download complete

Wh g is completed, proceed with the followings.

g is completed and step 4 of download procedure window appears, click Exit button.

2. Turn the power off and remove the Shunt and download cable 1 set on tray board

from step 1.

Firmware Upgrade (A611DN)

Main Firmware Upgrade (Download)

Firmware Update Using PC

0. Pre-setting

⦿ Connect PC and printer with USB cable

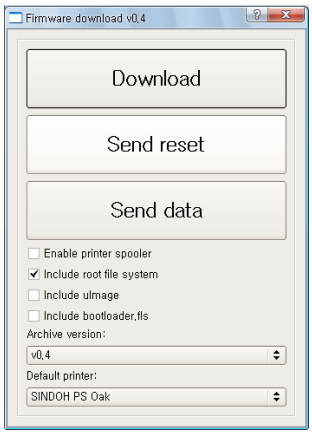
※ Note: A611 driver must be set as default printer on the PC.

1. Turn the printer on.

2. Set the printer as default printer from Printer and Fax window.

3. Run FirmwareDownload_log.exe file from Windows.

4. A download window appears as below.



5. Click Download (Using Send reset or Send data button not required)

6. Firmware will automatically be updated. Status will show on LCD.

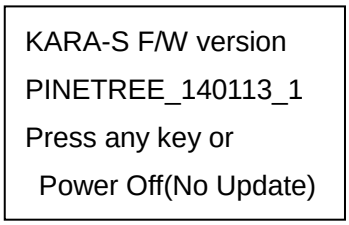
7. Printer reboots after updating. Once printer loads the Home screen, update has been successfully completed.

Firmware Update Using USB Thumb Drive

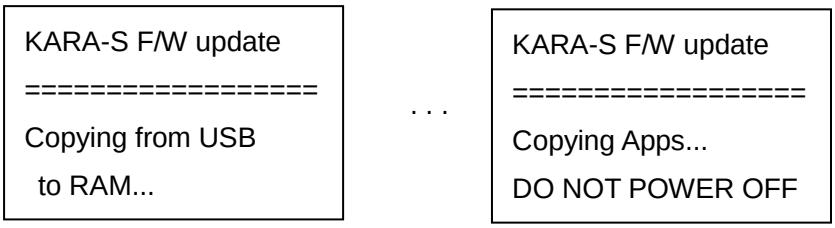
0. Pre-setting

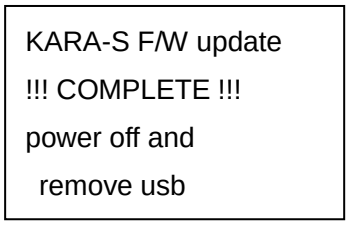
⦿ Copy Firmware file to “_update_kara” folder in USB Thumb Drive.

1. Turn on printer and wait until printer loads the Home screen.
2. Connect USB Thumb Drive to printer
3. Click OK when the following message appears on the printer’s screen.



4. Wait for update to be completed.



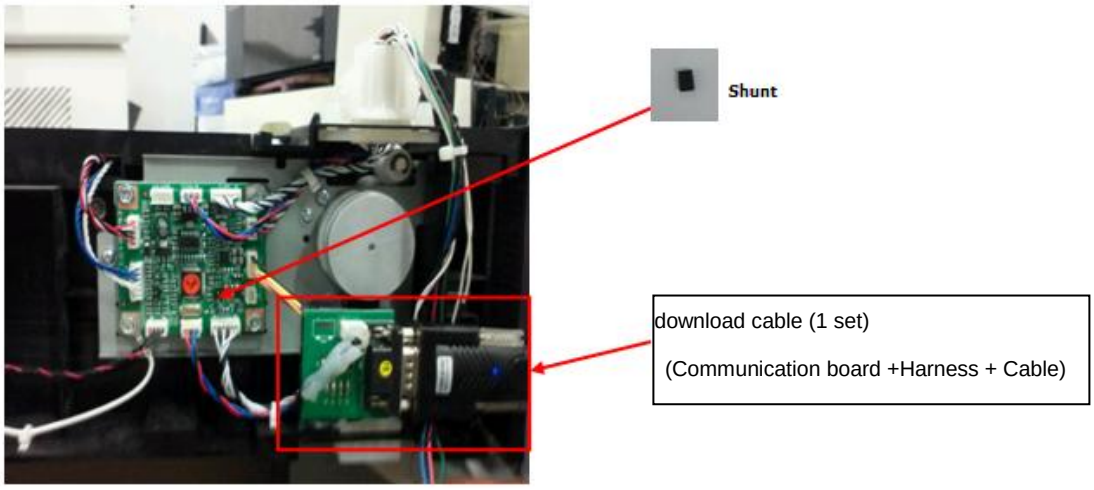


6. Check the following screen once update has been completed. Remove USB Thumb Drive and turn on printer.

Optional Tray Firmware Upgrade (Download)

Pre-setting (Step 1)

FlashSta must be installed on your PC, and KARASbank_vXX.XX.XX.mot and KARASbank_vXX.XX.XX.id files must be in the same folder. (vXX.XX.XX: F/W version)



Proceed with the followings before running the download program.

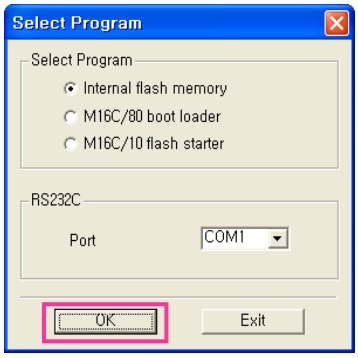
4. Turn the power off and plug Shunt on arrow to tray board as above figure.
5. Connect 1 set of download cable as the figure and connect it to serial port on PC.
6. When setting is completed as above figure, apply power.

Program Download (Step 2)

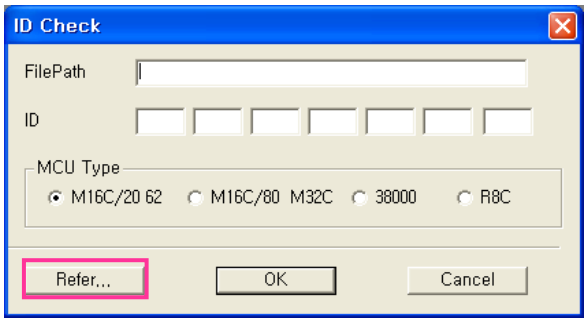
When step 1 is complete, run the FlashSta.exe file from PC.

Download will proceed as the followings.

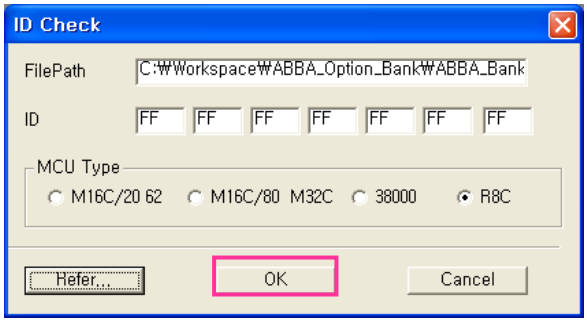
.(144 Page)



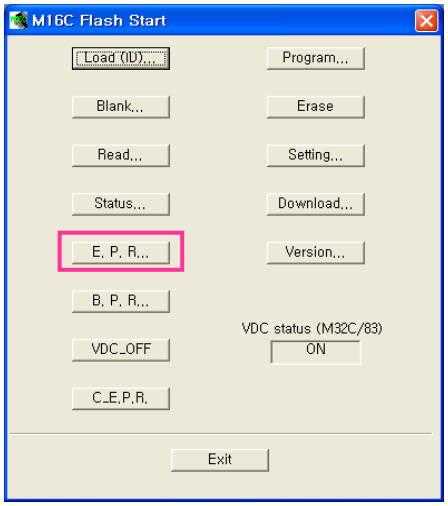
Step 1: Click OK.



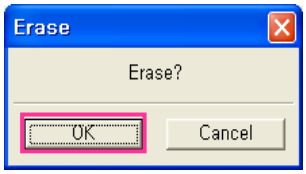
Step 2: Click Refer... and select and run ABBAbank.mot file from the folder.



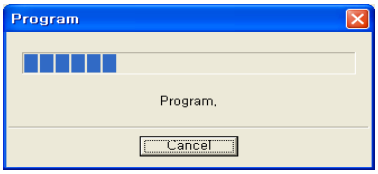
Step 3: When ID value is filled as above, click OK.



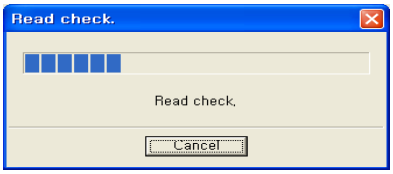
Step 4: Click E.P.R...



Step 5: Click OK.



Step 6: Downloading the program



Step 7: From Read Check.

Program Download (Step 2)

Wh g is completed, proceed with the followings.

g is complete and step 4 of download procedure window appears, click Exit button.

Step 8: Download complete

2. Turn the power off and remove the Shunt and download cable 1 set on tray board

from step 1.

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